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Address.

SOME THEORETICAL CONSIDERATIONS ON THE PRESENT STATUS OF ROENTGEN THERAPY.*

By **Joseph Shohan, M.D., Boston,**

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When we stop to consider the various contradictory effects of roentgen rays on living tissues, we realize at once the many difficulties—almost insurmountable difficulties—that we were bound to encounter when we attempted to make use of the rays in combating disease. Indeed, we are not at all surprised that so little progress has been made in roentgen therapy; rather that so much has been accomplished under such difficulties.

In the roentgen ray we certainly have an exceedingly paradoxical energy. It is claimed for it that it will cure cancer, and yet before anyone ever suspected that such beneficial properties resided in that ray, we learned that roentgen rays generated cancerous growth.

On the one hand, the roentgen rays excite epithelial growth, while on the other, they destroy embryonic tissue. On the one hand, they increase metabolism and raise the resistance of the organism, while on the other, they attack the leucocytes and hinder growth.

Whoever has had the misfortune to have a roentgen burn will testify to the fact that the pain caused by it is most excruciating. In fact, few pathologic conditions are known to cause such intense suffering. Yet roentgen rays, judiciously applied, are perhaps one of our best anodynes. Many a sufferer from some form of neuralgia, pruritus, arthritis, arthritis deformans, or similar painful condition, has been spared many a sleepless night by the use of roentgen rays.

No doubt, as a result of the contradictory effects of the roentgen rays, contradictory estimates and views of them have gained a foothold among the general public, as well as in the medical world.

There are those who behold in these rays the long-sought-for panacea of all the ills human flesh is heir to, and those who regard the rays as a new, insidious foe of mankind.

Which of these two diametrically opposed views is the correct one? They are both right and both wrong.

The epoch-making discovery of that renowned Wuerzburg professor has certainly claimed its full quota of victims, not as many among the general public as among the members of the medical profession, the undaunted followers of Roentgen. But for every victim it has claimed, it has brought relief from pain and cure from disease to hundreds and thousands the world over.

In the development of the application of the roentgen rays in medicine, accident played a not inconsiderable rôle. The old adage that "necessity is the mother of invention" does not tell the whole story. It seems to me that if necessity is the mother then accident must surely be the father. At any rate, in the case of roentgen rays accident played the more conspicuous rôle. For it was by sheer accident that Roentgen discovered these mysterious rays, and again, it was by sheer accident that the attention of the medical world was called to the possibility of combating human suffering with them.

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* Read before the South Boston Medical Society, February 7, 1916.

One day when Roentgen found—to his great surprise—that the rays from his tube penetrated opaque bodies, the significance of the use of these rays to the surgeon in cases of fracture became immediately apparent. As was to be expected, such was the first practical use of the rays.

Of course, the generating apparatus, as well as the tube, was necessarily crude and primitive, and as a result long exposures were necessary to radiograph any desired part. These long exposures of soft rays (rays coming from a tube that was not very highly evacuated) were not long in producing results,—results that were not sought for and often not desired, but results that, nevertheless, laid the foundation for modern roentgen therapy.

It was Leopold Freund of Vienna who, in 1896, a short twelve months after Roentgen's epoch-making discovery, happened to read in a local daily that someone who was working with roentgen rays a good deal suffered from dermatitis and falling out of the hair. Shortly after he also read an article by W. Marcouse, in which was related a similar experience. Freund was then moved to try this new agent to remove a hairy naevus. The success of this experiment gave roentgen therapy its first impulse.

A year later, we find Kuemmell, at the Congress of German Surgeons, reporting a case of lupus vulgaris successfully treated by means of these wonderful rays. Schiff, Hahn, Ehrman, Kienboeck, Holzknecht, and a host of others followed with the favorable reports of their experiences in the application of the roentgen rays in a number of skin lesions, Sjoergsen in cases of epithelioma.

A new era was opening for suffering humanity, for a new weapon was placed in the hands of the disciples of Esculapius.

With the wonted enthusiasm of the new convert, medical men the world over took up the study and practice of this new "ology," roentgenology. Some of these early enthusiasts have long since paid the penalty of their devotion and are sleeping peacefully their eternal sleep—all but forgotten. Others more fortunate are still with us, unlaurelled and undecorated heroes in the army of peace for the cause of suffering humanity.

We in Boston should take just pride in the fact that our city has produced one of these early pioneers in the person of Dr. Francis Williams. His contributions to the study of roentgenology form veritable landmarks and are, I hope, fully appreciated.

While the reports of wonderful cures and burning disappointments—burning in more than one sense—came thick and fast, the paramount question that agitated most of these workers was—how do these rays produce all these wonderful results? What was the *modus operandi?*

Fortunately, the medical man, with his traditional instinct for empiricism, did not stop too long in search of theories. He knew too well that the explanations of today are, alas, too often the fallacies of tomorrow. Nevertheless, in this age of rationalism, it was, of course, necessary to have a rational explanation for a basis of "rational therapy," as it is too often misleadingly termed. The rational explanations came in great profusion, needless to add, only to cause a good deal of confusion.

It was the electricity in the current with some; with others the ionization, the magnetic effect, the psychic effect. And the discussion waxed hot.

But before the roentgen therapeutist could find and give a satisfactory answer, the roentgen-physicist had to tell him first, what were those rays—what were their physical properties?

When Professor Roentgen in 1895 discovered that new type of radiation he himself suggested for it the term x-ray, doubtless not only for want of a more comprehensive term, but also because that new phenomenon presented to him an unknown quantity in more than one sense of the word.

Were these radiations solid particles, or were they waves? If waves, what kind—transverse like sound waves, or longitudinal like light waves? These points and a host of others kept the physicists in agitation for quite some time.

Today, the most important points are settled beyond dispute. We know that the roentgen rays are longitudinal electro-magnetic waves that can be deflected and refracted, and resemble the waves of gamma rays of radium, of ultraviolet rays, heat waves, the waves that transmit our wireless messages, and other light waves, and differ from them in one respect only, namely, the length of the wave. The length of the wave is the determining factor of its physical characteristics.

As R. Pohl aptly puts it, "The roentgen rays that emanate from our discharge tube or the roentgen rays that are emitted by radio-active substances known as gamma rays, are principally nothing else but light, and all that we know about light applies to these rays, with very few exceptions."[1]

But while the physicists were pursuing relentlessly their war on nature in their efforts to wrest from her the secrets of the wonderful rays, the therapeutist was not sitting idly by.

As mentioned before, skin lesions and epithelioma were the first to arrest the attention of medical men the world over, and skin therapy was all but revolutionized.

However, roentgen therapy, unlike maligned beauty, was not to be merely skin deep.

About the year 1903 Nicolas Senn conceived the idea of subjecting a leukemic patient to roentgen rays. He radiated the spleen of his patient, and to his great delight noticed a retrogression of the enlarged spleen and a general improvement in the condition of his patient. The report of his experiences in the *New York Medical Journal* of April, 1903, was at once taken up abroad with great enthusiasm and gave impetus to the classic researches on blood by Heineke, Linser and Helber, Jagic, and a host of others.

The year 1903 was destined to be a red-letter year in the annals of roentgen therapy. It was in 1903 that Albers Schoenberg of Hamburg, that martyr to the advancement of roentgenology, made his epoch-making observation of the phenomenon of sterility induced by roentgen rays. He made his first observations experimentally on rabbits and guinea-pigs. A year later Philipp reported the first two cases of sterility in human subjects.

This classic work of that master-mind, Albers Schoenberg, laid the foundation for our modern deep roentgen therapy, with all that it implies, and gave a new impetus to the roentgen therapeutist and renewed interest in the most absorbing questions,—how these rays influence living tissues and by what *modus operandi* we effect our cures and our injuries. For, as roentgen therapy assumed greater and yet greater proportions, the number of victims multiplied.

That it was not a mere chemical or physicochemical reaction between the rays and living tissues soon became evident.

I have already referred to Heineke's researches on the blood. He and the others showed that roentgen rays effect, at first, a short temporary rise in the white blood count followed by a drop, in which the polynuclear leucocytes suffer the most, and next to them the lymphocytes. Now, if that were a mere chemical reaction, the rays ought to affect the chemical composition of the blood in vitro—in the test tube. But Bergonie and Tribondeau as far back as 1908 submitted defibrinated blood to the action of the rays for as long as thirty minutes and failed to detect any change whatever. They also submitted spermatozoa to similar tests, with equally negative results. Bordier and others performed similar experiments with like results. Furthermore, it soon became apparent that different tissues, normal and pathological, under the same given conditions, react differently. We saw that the various constituents of the blood were not all affected alike: the polynuclears suffering the most, while the erythrocytes were hardly affected, even after prolonged exposures. The cells of the lymphoid tissue, of the hair papillae, and of the epithelioma readily succumb to the action of the rays, while the epithelia of the skin remain intact.

These phenomena were explained by some on the assumption of a selective action of the rays on the cells, *i.e.* the rays attack certain cells more vigorously than others. Others again saw in the cells themselves a variable vulnerability. Be that as it may, it is clear now that the reaction between the cells and the rays is a biochemic reaction. As Dean Butcher states it, "It is not the chemical reactions of material remedies, with which we are more or less familiar, but the impact of ethereal waves on living tissues. These ethereal waves of various lengths and frequencies are the real therapeutic agents."[2]

But if the length of the wave, or, in other words, the hardness of the ray is of prime importance, it probably is not all-important.

Wickham, whose work on the biochemistry of radio-activity is most painstaking, states:

"Every ray that strikes a cell, no matter what the source of the ray is, exerts some influence on the cell. This reaction is the result of many and various factors. The most important ones are:

"1. The degree of the receptivity of the cell; in other words, its specific radio-sensibility.

"2. The quantity of rays absorbed in a unit of time.

"3. The specific peculiarity of the kind of rays.

"4. The time elapsed between the radiation and the histologic examination.

"5. The filtration of the rays through the tissues."[3]

He says further that among all these factors the radio-sensibility of the cell is of the greatest interest. He continues, "When a cell is affected by the rays it is not correct to say that the ray has a specific action on the cell. It is not a question of specificity, rather of cell sensibility, of particular receptivity. This particular receptivity is what causes a penetrating ray to go through a layer of healthy tissue without affecting it, but when it finally reaches a pathological tissue underneath, it exerts an influence there."

We see from the foregoing that Wickham ascribes to the sensibility of the cell first importance, though, of course, he also takes into consideration the hardness of the ray, that is, the wave-length.

Several attempts have been made to classify the various living tissues in accordance with their radio-active sensitiveness. The following classification of Wetterer is, no doubt, the best:

"*Normal Tissues.*—Lymphoid tissue, testicles and ovaries, facial skin on child, child's cartilage, mucous membrane, hair papillae, child's body-skin, intima of blood vessels, skin on face of adult, sweat and sebaceous glands, skin on body and head of adult, liver and kidney parenchyma, blood vessels, connective tissues, muscles, cartilage of adult, bone.

"*Pathologic Tissues.* Leukemic and pseudoleukemic tissue, recent patches of psoriasis, acute eczema, chronic eczema, mycosis fungoides, lymphosarcoma, acne vulgaris, old patches of psoriasis, round cell sarcoma, hypertrophic prostate, hypertrophic lupus, tuberculous lymphoma, carcinoma, mycotic hair, bone tuberculosis, parenchymatous goitre, lupus planus, dry form, warts, lupus verrucosus, fibroma, myoma."[4]

It was left, however, to Bergonie and Tribondeau to formulate a law of the radio-sensibility of living tissue, which might be said both to generalize and express synthetically all our data on the subject of roentgen therapy. Their law reads: "The radio-sensibility of the living cell is directly proportional to:

"1. Its reproductive power,

"2. The duration of its karyokinetic process, and

"3. Inversely as its morphology and specific function are definite and stable."[5]

The third law really is merely a corollary to the first two.

To these three laws or generalizations Beclere added a fourth one. He states that "every living cell, be it healthy or diseased, when subjected to a sufficient amount of roentgen rays, will undergo chemical reactions, the ultimate result of which is the degeneration and death of the irradiated cell."[6]

We see thus, that in the reaction of the rays on the living cell the quality and quantity of the rays, as well as the kind and condition of the cell, are important factors. We can thus conceive of the rays as a stimulus acting on the living cell, affecting it in proportion to its vitality and stability. The young immature cell or the one still in the process of reproduction, when bombarded by the radiations, readily succumbs; while the mature and more stable cell resists onslaught, remains uninjured, and is, furthermore, stimulated to full and stable growth. This conception clarifies many of the seemingly paradoxical actions of roentgen rays on living tissues. It becomes clear to us why the skin is more sensitive than connective tissue and muscle fiber, why the rapidly multiplying lymphoid tissue is more sensitive than the skin. The phenomenon of sterility induced by roentgen rays becomes very evident. The polynuclears in the blood stream, as might be expected, are the worst sufferers when blood is radiated. This conception should also prompt us to apply roentgen therapy in conditions hitherto untried.

When I was at the St. Georg Hospital in Hamburg last winter, I had occasion to observe a large number of wounded soldiers with suppurating wounds, which, for some reason or other, refused to close up. They usually had an abundance of granulations, and a profuse creamy discharge. I suggested roentgenizing some of these wounds. Needless to add, I did not aim at a bactericidal effect, for the dose required to attain that is much too high for therapeutic purposes. What I hoped for was, on the one hand, to strike at the polynuclear leucocytes, which furnish almost all the pus cells; also at the granulation tissue, which consists of rapidly proliferating vascular endothelia and fibroblasts; and, on the other hand, to stimulate many of the more resisting fibroblasts to mature growth, and thus hasten cicatrization. My results exceeded my most sanguine expectations. A preliminary report of this work was made before the Hamburg Medical Society.

The next question that rational roentgen therapy had to answer was whether the action of the rays was purely local or systemic. In other words, is the effect of radiation merely the result of the reaction between the rays and the cells they happen to hit, or do the rays in some way exert an indirect distant influence over the entire organism? This question has more than academic interest, for were the effect a purely local one, we could never hope to accomplish anything with this new agent in our combat with malignant growths. No local agent, however promising, could ever prove successful against them, not alone because we are not at all certain that these growths are purely local phenomena, but also because in any given case of a malignant growth we have no means of ascertaining that some metastatic foci do not already exist at some distance from the given focus. No doubt, the much too common postoperative recurrences are in most cases due to remote metastatic foci. Wetterer, in discussing Ritter's negative experimental results, adds, "However, one is not justified in excluding the possibility of an indirect effect of radiation."[7]

F. Gudzent, in his lucid discussion of the influence of radio-active substances on the blood, says: "But the question whether this effect is a direct or indirect one is not yet settled today. However, the experimental observations that point to the contrary do not harmonize well with the common observations made by therapeutists. It is an established fact that leukemic tumors recede, even when they are not directly exposed to the action of the rays. Furthermore, as Arneth pointed out, the entire condition of the blood is greatly improved by the radiations; it undergoes a biologic alteration of function which could never be explained by the mere destruction of cells."[8]

Robert Knox, in his very admirable text-book, in the chapter on "Action of Radiations Upon Tissues," says: "The action of radium and x-rays upon the normal tissues and on morbid growths is. . . not purely a caustic action. In addition to the direct evidence of a local action of radiations upon the cell of a new growth and its surrounding tissues, there is reason to believe that a general effect is produced upon the whole body."[9] He points out the general improvement in the patient's health while under treatment, no matter what area of the body is radiated. He concludes: "The general effect may be quite as useful as the local, and if it has any value at all, it would be extremely useful to bear it in mind, because one need not then limit the areas of exposure. After local treatment has been pushed to its limit, the treatment may be continued in other parts of the body'',[9]—a very valuable and far-reaching suggestion.

While the experimental evidence is as yet not conclusive, the empirical evidence is overwhelming that the effect is systemic as well as local.

Of late years the post-operative radiation of all malignant cases has become almost universal in Western European clinics. The observation was soon made by many roentgen therapeutists that when they radiated the scar of an amputated breast, in many instances, the enlarged glands in the axilla disappeared of themselves, although never exposed to the rays. It was further observed that quite often while a patient was being treated locally for malignancy of the breast, a foul vaginal discharge from which she happened to suffer at the time was markedly improved. These and similar phenomena could be explained only on the assumption that the rays effect a systemic action.

How this is brought about is of less practical import to the therapeutist. I shall merely mention that three hypotheses have been advanced. The radio-vaccine hypothesis of Dean Butcher is probably the most plausible one. As opposed to this vitalistic theory, Professor Stephane Leduc proposed the mechanistic theory. Another is the so-called cannibalistic theory of Ross. I do not intend to enter here into a discussion of the merits of these different hypotheses. But I do want to call your attention to the circumstance that every time we roentgenize any given area, we thereby also radiate the entire volume of blood. Landois states that the duration of the blood circulation in a healthy human subject, with a pulse-rate of 72 per minute, is 22.5 seconds.[10] This being so, it follows that the entire volume of blood passes through the heart in 22.5 seconds. Were we to roentgenize the heart area with sufficiently hard rays, say a parallel spark gap of 10 inches, then the blood in the heart would receive approximately half of the skin dose. If the skin dose-administered through several ports of entry were 100X, then the heart would receive about half of the skin dose, or 50X, and the entire volume of blood would receive 2.25X—quite a respectable dose, when we stop to consider that 1/13 of the whole body weight is subjected to it.

What is true of the heart must needs be true whenever we radiate any given vascular area in which the combined volume of its blood vessels is equal to the volume of blood in the heart. And this roentgenized blood makes its way freely through the entire organism, and bathes every one of its cells. Such being the case, it is difficult to conceive of the blood not exerting a greater or less indirect influence over the entire organism.

In the foregoing I have attempted to point out the theoretical difficulties which roentgen therapy met on its way, and to a certain extent overcame. There were, however, others more immediate and more practical. The problem of dosage soon assumed formidable proportions. As soon as we found out that radiation in certain amounts proved beneficial, while in other amounts harmful, it became evident that without some means of measuring the exact amount to be given in each case, we were all at sea, and roentgen therapy was without a future. For, with too much caution, we might administer less than was necessary, and defeat our object. Nay more, we might even harm our patient with the smallness of the dose, or administer an overdose, with invariably disastrous results.

For a while the roentgen therapeutist certainly worked under difficulties, keeping within the safest possible bounds, and almost despairing of better days. It was then that Guido Holzknecht, the foremost of our pioneers, and himself a victim of his roentgen experiments, came to the rescue and devised his dosimeter. He was followed by Kienbœck, Sabouraud, and others with various devices. To be sure, a great deal is still to be desired in the matter of quantimetry, but Holzknecht's device was certainly a great step in the right direction.

We hear nowadays a great deal about deep-therapy. Usually we mean by that therapy in gynecology, although it really refers to the therapy of all deep-seated organs. Now deep-therapy is not conceivable without the classic researches of Perthes in the matter of filters. It was again in 1903, in that red-letter year, as I have already termed it, that Perthes called attention to the fact that it must needs be possible to increase the deep effect of radiation, when a filter of some sort, like aluminum, is interposed between the tube and the patient, thus intercepting the soft rays and permitting the hard ones to reach the patient. He added that it would be desirable to ascertain to what extent this increased effect can be induced. And he did determine it, for in the following year he published his researches, which, as Gauss and Lembcke—the fathers of modern intensive therapy—say, were of fundamental significance for the development of deep-therapy.

Indeed, while it is true that in the early years roentgen therapy was confined merely to skin disorders and other superficial lesions because of the lack of proper appliances, lack of dosimeter, lack of filter, and even lack of appropriate tubes, today the conditions are altogether changed. In this connection let me state that the perfected tube of Dr. Coolidge has improved the armamentarium of the roentgen therapeutist a hundredfold.

To-day, deep as well as superficial roentgen therapy is no longer an experiment but an established fact.

We have seen how the theoretical ground has been cleared from the physical as well as from the biochemical aspect, the practical and technical difficulties have been overcome one by one. The purely empirical experience of the laboratory therapeutists has grown so fast that it forms a vast literature of its own.

It is not my intention to-night to enter into a discussion of skin therapy; the roentgen ray as a therapeutic agent in dermatology has long proved its worth and is established as the remedy par excellence for many skin diseases, especially those of a more chronic nature. Slowly but surely roentgen therapy is widening its scope in internal medicine, surgery, and last but not least, gynecology.

As far back as 1902, fourteen years ago, Dr. Francis Williams treated the first case of Basedow in his roentgen laboratory. He was followed by the late Carl Beck, and a host of others. It was at that memorable meeting of the medical society of Vienna, where Holzknecht, then a comparatively young docent, made his brilliant retort to the well-known Professor v. Eiselsberg. Professor Eiselsberg, one of Austria's foremost surgeons, discredited roentgen therapy in Basedow, and went so far as to accuse it of causing adhesions and making any subsequent operation more difficult. Holzknecht demonstrated a series of cases and remarked, "You see, gentlemen, that the roentgen therapy is not at all 'immaterial' and is not effective 'only on rare occasions,' as Professor von Eiselsberg would have you believe, rather are the good results frequent, and at times brilliant." In defense of roentgen therapy he quotes from a letter that he received from Carl Beck, in which the latter had stated, "In Basedow my results in most cases are downright wonderful; in smaller struma I had only one failure out of 38 cases, five of these were partly successful. The result in the other 32 cases—90%—was just splendid."[11]

Belot reported recently 30 cases of Basedow, out of which only five showed no improvement, and those were not true Basedow's. He quotes Ledaux-Lebard, who said, when speaking of roentgen therapy in Basedow, "everything goes along in the favorable cases as though under the influence of the roentgen rays, the hyperthyroidism is gradually substituted by normal secretions, or as though the very products of the glands gradually approached the normal."[12]

I recollect three cases that I had under treatment while I was assistant to Albers Schoenberg. One was a post-operative case in which one lobe was removed and the other roentgenized. Beck was the first to suggest this combined method. I could see constant improvement in the three cases, both subjectively and objectively, while I had them under my observation.

I have mentioned before Senn's classic case of leukemia. The medical literature of to-day is full of hundreds, possibly thousands, of cases reported, some with more, others with less favorable results. Beclere recently reported 110 cases, some of those observed since 1904. In talking of the lymphatic leukemia (12 cases) he says that all these cases have been influenced by the radiation quite remarkably. The first sign of improvement was the return of the patient's strength; along with the diminution of the spleen and lymph nodules came the disappearance of the insomnia, the return of the appetite, and the increase in weight.

He had ninety-three cases of myeloid leukemia. Of these he says, "The consequence of our treatment was that up to date we did not have any case that was not favorably influenced by it."[13]

The treatment of phthises is still *sub judice*, but the experimental and clinical work of De la Camp and of L. Kuepferle are highly interesting and worthy of attention.

For a while I had a patient under treatment—a far gone case—nevertheless, I noticed a marked diminution of sputum, and, what was more interesting, she gained a pound during the first week of treatment, the first pound she had gained in many months.

I spoke of the roentgen rays as an anodyne in neuralgia, sciatica, pruritus, arthritis, and the like. I recall one interesting incident that occurred while I was in Hamburg. One morning I overheard a conversation between two patients in the treatment room. One was saying to the other, "Say, why don't you ask him, he will do it?" As I approached they said no more. When I inquired of one what it was all about, she informed me that she had merely suggested to Frau So-and-So to ask me to treat her sciatica, which had continued bad for the past few days. Frau So-and-So was being treated for mediastinal sarcoma post-operative. I asked her how she knew of the treatment of sciatica by roentgen rays, and whether she believed that the rays were a cure-all. "Oh, no," was the frank answer, "but my sciatica does not trouble me any since I am being treated." Now this patient was being treated for a good-sized fibroid, and received roentgenizations posteriorly as well as anteriorly. It was new to me, and I told my chief what I had learned from my patients. He laughed and said that he knew that such cases were reported, although he had never treated any knowingly.

As a matter of fact the utilization of the roentgen rays as an anodyne dates as far back as 1897, two years after the discovery of the rays. Gocht reports a case of long-standing trigeminus neuralgia. The patient came to him for surgical aid, for his suffering was intense and could be relieved only by large doses of morphine. Instead of resorting to an operation, Gocht tried, by way of experiment, to expose his patient to the roentgen rays. Much to the surprise and delight of both doctor and patient, after the second day of treatment the patient was free from pain and could get along without morphine.[14]

Numerous similar results have been reported since then, both in this country and in Europe.

Engelken reports a very striking case. A man, 48 years old, suffering from right-sided neuralgia of a branch of the trifacial nerve, was operated on, and the offending nerve was removed without any relief to the sufferer. After four radiations of fifteen minutes, the patient was free from pain. There was a relapse four weeks later, which yielded to treatment in a similar manner.[15]

Tuberculous lymphadenitis forms a particularly grateful field for the roentgen therapeutist. These cases, judiciously selected, yield to treatment almost invariably. In view of the good results reported by all observers and amply sustained by my own experience in a number of cases, I feel that it is an injustice to disfigure so many faces, when by means of roentgenization they could well be left unmarred. At least, it seems to me that every victim of tuberculous glands has a right to demand from us that we give him a chance by means of roentgen therapy to escape the scarring of the surgeon's scalpel.

Roentgenotherapy in gynecology is a very broad subject, and I can not stop to discuss it in detail now. In European clinics, at least, it is too well established to need any argument in its favor. Out of the Freiburg clinic, Gauss and Lembcke reported two hundred and five cases. These were treated between 1908 and 1912, a period of four years, and comprise cases of myomata and various forms of metropathies. The former class of patients form by far the largest number. The object of the treatment in all these cases was to produce amenorrhea, and where a tumor was present, to reduce it in size. Both these objects were attained in practically all the cases. The results were particularly brilliant in the last two series of cases after they had perfected their technic, which enabled them to administer large doses. In their summary they go so far as to declare, "We are now so certain of our technic that we can cure our patients in a short time to stay cured, no matter what their age and the size of the tumor may be."[16]

Beclere recently reported sixty-six gynecologic cases treated by him with roentgen rays. Six of these patients were treated for bleeding only—no tumors of any kind could be made out. Two of these even had a subnormal uterus. All the other cases showed a palpable tumor, and complained of irregular uterine hemorrhages. He states that "the attained results in all those cases were very favorable." He adds, "in the treatment of the uterine myoma by roentgen rays, more importance is to be attached to the direct action of the rays on the tumor muscle itself than on its indirect action through their influence on the ovaries."[17]

My personal observations in the laboratory of Albers Schoenberg bear out fully the statement of Gauss and Lembcke. A large number of patients of various ages were treated there for various conditions, such as myoma, fibroma, climacteric disturbances, and metropathies of various kinds. I recall a vary striking case of a young woman of 34, who came to us almost in a state of collapse from dissanguination. She suffered from anemic headaches, cardiac palpitation, insomnia, and general debility. She responded to treatment remarkably well. I left the laboratory while she was still under treatment, but her uterine hemorrhages had almost ceased.

Such and similar observations lead me to conclude that in all cases of fibromata and myomata the very least we should do, in justice to ourselves and to our patient, is to let her choose between surgical therapy and roentgen therapy; for where there are no indications to the contrary, the latter is at least as efficient as the former, without its accompanying risk.

F. Ebler, in discussing roentgen therapy in gynecology, remarks, "The time is not far distant when no gynecologist will be considered progressive who will not use roentgen rays in his daily practice."[18]

Before I close, I wish to say a few words on the present status of roentgen therapy in malignant cases.

If the biochemical theories which I have briefly discussed before mean anything at all—and they surely mean a great deal if the generalizations as laid down by Bergoni and Tribondeau synthesize the facts—then there is ample reason to hope that roentgen therapy has within itself the promise of a better day for the sufferers from malignant diseases.

Kroenig of Freiburg and his followers, already a school by themselves, some of whom I know to have come to scoff and stayed to pray, have already placed their knives back in their sheaths and have replaced them with the roentgen tube. I am not quite ready to follow their lead yet, but for the glory of surgery and in justice to humanity, let at least every post-operative case be judiciously roentgenized. We shall surely have fewer recurrences then.

The pioneer work has long been done. It is for us to do the rest.

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Original Articles.

SOME EFFICIENCY PROBLEMS IN COUNTRY MEDICAL PRACTICE.*

BY FRANK H. WASHBURN, M.D., HOLDEN, MASS.

Not many decades ago an individual afflicted with disease often determined his own prognosis in the choice of his physician; *i.e.* results, as far as medical influence affected them, depended upon the skill and judgment of his doctor, who worked, usually single-handed, with the resources at his command, largely his personal, mental and material equipment.

Since the advent of the microscope, the arrival of the influence of biology, of animal experimentation, the entrance of the various branches of science into diagnosis, the increase of specialization, the development of instruments of precision, the organization of public health forces, and finally the development of team work, not only in surgery but in the diagnosis and the therapeusis of internal medicine, there has developed in every community what may be termed its "medical machinery" and upon the efficiency or inefficiency of this structure depends the prognosis of an individual case rather than upon any personage. To be sure, the keenness and conscience of the practitioner consulted is and probably ever will be a factor of great importance.

It would be a waste of time to enumerate all the component parts of this health promotion group, or this "machine," which exists in every municipality; however, it must be apparent that the smaller the community the less elaborate, if not less efficient, must this be.

It is of the development of the efficiency of this "medical machine" in small communities, rather than that of individual effectiveness, we wish to speak; and although we are all factors, or parts, but limited discussion of the individual as such will be entered into.

That the stigma of comparative inefficiency to some degree occasionally attaches to the country practitioner may be asserted without fear of successful contradiction. Whether the brand be just or unjust, or whether his actual shortcomings be fancied or real, does not alter this fact. In support of this statement the essayist recalls the fact that when he made his debut in his present village location, one of his greatest assets was the prevalent knowledge that he had practised in Boston. The fact that he had been a mere struggler there, and for but a brief period, mattered not. Conversely, he recalls that being a country doctor became somewhat of a handicap in his Worcester practice a few years ago.

A short time since there appeared in the *Journal of the American Medical Association* an article on the "Conduct of Normal Labor," which probably would have been a timely essay had it been published a quarter of a century ago. Many protests were received by the editor, who explained its appearance by stating that it was intended for the men who practise in the country, away from the great medical centres. It was gratifying to note that a deluge of protests emanating from country doctors all over the United States were poured in upon the editor of the journal, indicating that some, at least, do not grease their hands with petrolatum before inserting them into the uterine cavity, and that rubber gloves are not unknown even in the backwoods.

Before we who practise in the suburban and rural districts refute this charge of comparative inefficiency, let us analyze, as far as we may, our conditions, and by a process of introspection examine the motes that may have lodged in our conjunctivae.

We trust it may be granted that the men who enter upon country practice as they leave the medical school and hospital are, on the average, practically as well equipped as they who begin their professional work in the great cities.

Even this is sometimes controverted. In the recent State Board number of the *Journal of the American Medical Association*, Gordon Wilson, in an article on "Medical Education with Reference to Rural Communities," endeavors to show that college-bred men graduating from high-grade medical schools avoid rural communities, and suggests two grades of medical schools, evidently intending the class of schools having low-grade requirements to furnish men for country practice. No one doubts that certain men train with definite hospital appointments and teaching positions in view, and finish their medical training equipped to the superlative degree. Such men, of course, do not even consider a country location,—however, they form but an exceedingly small percentage of even the thoroughly trained. To the rank and file, we feel that both city and country appeal, regardless of preparation.

The desire to gain an active practice quickly, the love of the open and the demands of broken health are among the most frequent incentives to the young physician's choice of a country practice. As he becomes established, he learns that his ever-increasing activities bring him in contact with an endless variety of humanity and of social phases; and as varied morbid psychic and physical conditions. He is thrown upon his own resources, often where his city brother may share his responsibilities with his neighboring colleagues.

What a school of self-reliance this should be, and is; but there is another phase. One here finds himself doing one of two things,—either endeavoring to meet, unaided, many medical problems, whether involving the eye and ear, or the genito-urinary system, the female reproductive organs, the digestive tract, or "what not"; or he is directing his clientele to the various specialists of varied eminence, practising in their restricted fields in the most accessible large centre.

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* Read before the Worcester District Medical Society, April 12, 1916.

The first is inclined to spread himself out thinner and thinner as the demands upon him increase, until he is brought face to face with the problem of combating the tendency to superficial attention to his cases, and likewise superficial knowledge. The second tends to lack of confidence and self-reliance, and to final deterioration into a human guideboard.

These are but propensities, for it is apparent that only a portion become superficial thinkers, or acquire justification to have "dirigo" placed upon their tombstones.

The doctor in the less populated district has few colleagues about him, and too often he considers them as competitors. The prospect, or rather fear, that he may lose patients deters him from leaving home for post-graduate study and recreation, thus the tendency to become "stale," as we say, with the resulting sluggish cerebration and mental astigmatism and myopia.

The country doctor pays a little more for every domestic commodity—his groceries, meats, coal, electric lights, etc.—than does his city brother. His area of travel is greater, and likewise the expense in time and money in reaching his cases. His rent, if he does not own his home, may be a trifle less. That he gets less of the modern conveniences is not relevant. He charges fees that are less by 30 to 40% than those of the urban doctor. He gives away throughout each year hundreds of dollars' worth of drugs. All these are mentioned as retarding the growth of his armamentarium, and especially of his library,—his "sine qua non" as regards mental improvement.

Because of the inaccessibility of hospitals, his emergencies are often attended without the assistance of competent nursing, and his charity cases are, necessarily, usually attended without the help of trained assistance of any kind, however urgent may be the need; thus another tendency to inferior results.

He is remote from clinics, the meeting-places of his societies, libraries, and that which is fully as important,—the proximity to enthusiastic men with whom he may discuss his cases and talk shop.

Now what should concern the individual rural medical practitioner himself is the question as to whether he has done his part in maintaining and enhancing his personal efficiency, and that of the health promotion and conservation forces potential in his community.

Critical introspection long ago forced upon the writer the secret acknowledgment that the "medical machine" of his neighborhood, of which he was a part, needed much adjusting to meet its normal efficiency and output. A more or less definite plan was outlined, and it occurs to us that, while as yet little has been achieved, the incipient efforts of my colleagues and myself to better medical results in Holden—a town of less than 2500 permanent residents—might be of interest, as illustrations in this discussion, to others similarly located, and that mutually beneficial suggestions might result.

First, and most important, the acquisition of personal knowledge must be an important part of any plan of this kind, and feeling that our position, in this respect, contains nothing to exhibit, we merely leave this as a general statement. No man should be satisfied with what he can "dig out" from his own experience and the literature at his command, however valuable, but should get into personal touch with the work of others. Whether one's interest lies in the line of surgery or internal medicine, post-graduate study, visits to the master teachers and their clinics should be aimed at. The actual achievement is possible only through expenditure of time and money. If one exists upon the ordinary income from country practice, this is difficult. This leads us to the consideration of the commercial phase of practice, a subject we are reluctant to touch, yet, as long as we must exist under a system of profit, just as does the tradesman, we must face it. In Holden we have gradually increased our fees. That gradual increase will stop only when we are getting material return for our work equal to that of city practitioners, and can support our families somewhere near equally with our neighbors, who are tradesmen, clerks and mechanics. To those who are deferring raising their fees because neighboring physicians are not ready to come in, we can say from personal experience that only a negligible amount of practice is lost, and one's condition is but improved by independent action.

To our confrères of the towns, we wish to say that, although we have discussed what might be termed the etiological phase of lack of efficiency, we have intended to refrain from actual admission, but are trying to view what others think of us.

Now people expect what they pay for, and while we offer our services for three-fourths of the value placed upon theirs by certain others, can we but expect the public to judge us by any other than its usual standard of values? We trust that no one will misunderstand our position, especially to conclude that we stand for grasping.

While we advocate a greater income for our services, or rather, while necessity demands it in the interest of efficiency, we must ever keep in mind the ideals of our profession, and the fact that primarily our object is a humane one, and that our ministrations should be given freely to the poor, and proper reductions be made to those of small means. Equal service should be rendered to all.

Briefly, our vocation is primarily a profession; our incentives, education, science and humanity. But incidentally our very existence, and professional improvement as well, demands a certain amount of "cold cash." I know of no desirable alternative to charging those who are able to pay, a fee that will compensate for our altruism to the extent of, at least, ensuring us an income by means of which we may live honestly and at the same time keep pace with current professional advances.

No plan of mutual improvement can meet with its maximum success without neighborly association among members of the local profession, and the absolute quashing of professional jealousy. We have found that, whereas formerly we considered the employment of a "locum tenens," during temporary absence from our practice, necessary, it has proven no less profitable merely to turn the work over to our colleagues, permitting the patients to make the choice. Enhancing this friendly state, and to the improvement of actual results, we have found our neighbors better qualified for certain work than ourselves; thus one takes an interest in the neuroses and in electro-therapeutics, and as all such special cases in a small town are but enough to support one good equipment, the cases needing special thought are referred to him; another acquires supremacy in skill in anesthetizing, and should have that practice. In this way we may divide the work to our mutual relief, as well as benefit to the patient. "Creeping into the lives of men everywhere," said Elbert Hubbard, "is the thought that cooperation is better than competition. We need each other."

The practitioners of three or four contiguous small towns may unite in a medical club, with splendid results. The free discussion at these less formal clubs often creates an interest among the members which tends to the exchange of much practical knowledge. The long distances necessarily traveled by the members who attend is, since the automobile has become the universal mode of travel for the doctor, less of an obstacle. We recall many profitable evenings spent with the Rutland Clinical Club.

We have no intention of discussing the pros and cons of drug dispensing, but wish to say that unquestionably it is an impossibility for one to have at hand all the remedies desirable for modern therapeusis.

A practitioner whose only source of immediate supply is his own drug stock is daily forced to make undesirable substitutions. The coming of a *reliable* pharmacy to any town where none has previously existed should, in the interest of therapeutic results, meet the approval and welcome of its doctors.

When some of the local societies began to talk of a visiting nurse for Holden its physicians approved. The visiting nurse is the solution of many of our efficiency problems in rural practice. She brings asepsis to the mill tenement obstetric case; she ensures the pursuit of a hygienic regimen in the home-treated tuberculous case; she may follow up the suggestions of the school physician and make his work bring results, and she may be an invaluable assistant to the board of health. Our society has disseminated knowledge by lectures at its meetings upon "Rural Hygiene," "Facts About Cancer," "Oral Prophylaxis," "Common Sense in Contagious Diseases," "Tuberculosis," "Prenatal Care," etc., and hopes to enlarge its scope in the future.

A few years ago some of the public-spirited men of Holden met with its physicians, and discussed the practicability of a small public hospital. At that time it appeared evident that the money could have been raised for the building and equipment, but none of us felt that we could prophesy a proper maintenance in so small a town without an available fund of some kind. Subsequent experience has taught us that it could have been accomplished. While that scheme was suspended, the need of hospital advantages for our patients continued, resulting in the opening, something over a year ago, of the Holden Cottage Hospital, which is under private control, but attempts the functions of a public hospital. This institution is a small nursing home, modest in its outlay, consisting of a 10-room house, equipped with accommodations for five or six patients, and the necessary appliances for the care of medical, surgical, and obstetrical cases.

The operating room, while small, is supplied with good north and west light in day, and ample electric illumination by night. The sterilizing apparatus is, at present, of the nonpressure type, requiring considerable time and attention in its operation, but efficient for perfect asepsis. Essentials consistent with modest outlay have been aimed at, and elaborate appliances have not been possible.

The hospital is owned and conducted by a lady—not a trained nurse—and her husband. One trained nurse is constantly in charge; others are employed as occasion permits. The average number of nurses the first year was about two. At operations requiring an extra nurse, the visiting nurse is employed. In this way we are enabled to maintain something of a team. The privileges of the hospital are open to any physician in the community, or any other practitioner of known reliability.

The charges for board and nursing are from $15 to $25 per week, with an extra fee for use of the surgery, dressings, etc.

The following brief abstract of the first year's report is submitted:

Number of admissions		74
Male	35	
Female	39	
Residences:		
Holden	44	
Worcester	15	
Other cities and towns	15	

The cases for treatment were:

Medical	17
Surgical	48
Medical and surgical	2
Obstetrical	7

Of the 74 cases 5 died.

Besides these, there were 5 newborn with one stillbirth.

The causes of death were:

Medical—uremia	2
Acute colitis	1
Chronic asthmatic bronchiolitis	1
Surgical—acute intestinal obstruction	1

This death followed operation upon strangulated femoral hernia in an old lady of 75 who had suffered from one attack of uremia due to chronic Bright's disease.

Operations under general anesthesia	40
Operations under local anesthesia	4
Operations without anesthesia	4
Average number of patients per day	2 55/73
Least 0. Most 7. Average stay	8 34/37 days

While it may be outside the intended scope of this paper to describe details of the surgical work, I desire to allude briefly to two or three of the most prominent features in routine procedure. My reason for this results from a conference, at about the time of starting the project, with a member of our society who is a prominent surgeon and a valued personal friend, from whose conversation I inferred there might be doubt as to whether some of the refinements of modern technic could be accomplished under conditions which must obtain in so small an institution.

While any visitor or consultant uses methods to his liking, ordinarily we confine our aseptic technic to the simplest. Iodine preparation of dry surfaces, or thorough cleansing of moist surfaces with soap and water followed by ablutions of 70% alcohol, constitutes the whole scheme of skin preparation in the patient. Soap and water, boiled rubber gloves and 70% alcohol suffice for the operator's hands. As few drapings as necessary to cover the field properly, and as few assistants as consistent with reasonable needs, are used.

While strict asepis is the "sine qua non," next in importance we consider the *anesthesia*.

If the patient is in hand for a sufficient period, he is put upon a low proteid, high carbohydrate diet, believing that we may in this way in some measure lessen the possibility of post-anesthetic acidosis. Other dietary changes are made for special conditions. Each patient undergoes a thorough examination prior to being given a general anesthetic. A chemical examination of the urine is madè, and a microscopical examination of the sediment if there is *reason for* it. When any renal lesion or continued urinary obstruction is present or suspected, functional kidney tests are made. Blood pressure and cardiac abnormalities are brought to the attention of the anesthetist. If anemic, the hemoglobin is estimated. Unless contraindicated, morphine and atropine, in suitable dosage, are given subcutaneously one-half to three-fourths hour prior to starting ether. We prefer the open-drop method of giving ether, yet concede that good etherizing may be done by other methods. While impressed by the reports of the experimental work of Yandell Henderson, we are unconvinced, by Henderson and Bryant's argument, of the greater safety of the closed and quasi-closed methods. Undoubtedly, acapnia, which they point out as the real danger, is at least a pertinent one, and the color sign a valuable warning and guide; yet, while our anesthesias amount to but few hundreds, we feel that the striking difference in the amount of post-anesthetic shock, nausea and other untoward results favor the open method.

An anesthesia slip is filled out, upon which is recorded the amount used, and all facts bearing upon the anesthesia. In bad ether risks, local novocaine anesthesia is used and just ether enough, when demanded, to meet the exigency. Every ether patient is watched to recovery by a *trained* nurse. This is insisted upon unless a physician is present. One physician in town does nearly all the anesthetizing. Occasionally one skilled in giving ether is called from a distance.

In brief, the safety and efficiency of operation is affected by the anesthetic, especially by the manner of administration, and we believe that the anesthetist should take his work seriously and expect and receive, in pay cases, a respectable fee.

Specimens for examination are sent to a pathologist. Such work only as urine, sputum and blood examinations, the inoculation of guinea-pigs, etc., is done in the hospital laboratory.

We have endeavored to develop something of a team, and while still very imperfect, we are pleased to say, with gradual improvement. Consultants are freely called, and when special conditions, as occasionally happens, indicate it, patients are referred to other and larger clinics.

Any patient, medical or surgical, admitted to the hospital, is considered primarily a patient of the physician in attendance prior to admission, and but temporarily under the care of whoever treats him. The benefit of his doctor's history of the case, and his advice, is sought and appreciated. On discharge we endeavor to relinquish the patient in a manner that he may carry the same high opinion of his family medical adviser which he held on his admission. We endeavor, with the assistance of the family physician and the visiting nurse, to follow up discharged patients, where any practical result may be obtained.

The Holden Cottage Hospital has not decreased our work, our anxieties or our debts. It has enabled us to study some of our cases advantageously, we believe, to the good of all concerned. Its work has thus far been accomplished with very limited capital, and its continued existence is only a question of dollars.

But one more factor in our structure will be mentioned. Obviously the present system of health departments, generally in vogue in towns, is no longer sufficiently effective. The duties of a board of health are invested in the board of selectmen, who delegate the executive work to someone designated by them as health officer, usually a practising physician. The scope of departments of sanitation has greatly broadened, in recent times, so that a separate board of health, at least, should be adopted. The best method of which we are aware involves, besides this, the union of a group of contiguous small towns in the employment of a trained health officer, in the manner now practised in the employment of school superintendents. The building laws for towns will undoubtedly be adopted generally as soon as the public become informed of their moral, sanitary and other benefits, and their effectiveness will be in ratio to the potency of local health departments. The initial movement toward changes of this kind must emanate from physicians.

Holden is at present, in this respect, still in the antiquated list, but we are hoping for the ultimate adoption of some such system as that above outlined.

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CIRCULATORY DISTURBANCE IN THE OBESE.

By Clifton L. Buck, M.D., Danvers, Mass.

Before entering upon the treatment of any cardiac affection it is necessary that a clear understanding of the various influences which may affect the circulatory organs in that particular case should be thoroughly understood. This is still more true if we desire to treat the patient on a rational system and not as a matter of rule of thumb, since, on careful analysis, the symptoms and circumstances which have led to the circulatory disturbance will be found to vary so widely that each case must be treated according to its especial indications.

It is the purpose of this paper to call attention to one factor in the treatment and prophylaxis of circulatory disturbances which, judging from the brief references in the text-books, and most special articles, has not received as much attention as it would seem to warrant, since it is a condition seen very frequently in general practice. I refer to circulatory disturbance in the obese; that is, circulatory disease in patients who are overweight for their height, age, and general build.

Obesity in youth and early adult life, unless complicated by cardiac disease, is, as a rule, not serious. After 35-40 years, however, men and women are very apt to take on weight more rapidly because of lessened muscular activity without a corresponding decrease in the amount and caloric value of food taken. It is at this time that the degenerative diseases of the circulatory system often begin.

In many cases there seems to be a family tendency toward the development of obesity. This may or may not be the result of some perverted action of the so-called ductless glandular system. That this system does have some influence over metabolic processes may be inferred from the well-known changes which result from disturbance of thyroid secretion, as in exophthalmic goitre, myxedema, and in the marked bodily changes following castration. However, in practically all cases of obesity a greater or less excess of the fat-producing elements in the food exists. That this daily excess may be small and still result in the development of obesity may be appreciated when it is considered that the addition of only 10 grams of butter to the daily diet would result in the addition of approximately 90 calories to the fuel value of the diet. This excess continued for one month would result in the addition of approximately 2700 excess calories; food sufficient to supply an average-sized man for one day, at light work.

That an excess of fat may cause circulatory disturbance, or seriously affect the action of a heart crippled by some acute disease, as rheumatism, scarlet fever, or repeated attacks of tonsillitis, is readily seen when it is considered that the main purpose of fat in the body is to serve as a source of reserve energy. When an excess of food is taken, that is, when the calorie value of the diet is greater than is needed to meet the body requirements, the excess not needed is deposited as fat.

The fat deposits are particularly well marked around the heart, in the omentum, abdominal wall, and in the arms and legs. The fat around the heart interferes with the action of that organ by restriction of space in the pericardial sac, by deposit between the individual muscle fibers, and by its extra weight. In the abdomen the fat interferes with the action of the diaphragm, the principal muscle of respiration, thus tending to cause improper oxygenation of the blood. Since to supply the extra fat with nourishment more blood-vessels and a larger volume of blood are needed, in all these cases a high blood pressure is found unless there is cardiac dilatation. This means extra work for the heart to do and gives rise to cardiac hypertrophy with danger of dilatation and cardiac insufficiency. The excretory organs may become congested and in many cases albumen may be found in the urine, which suggests nephritis. Apparently, also, waste products of metabolism may be retained in the blood and give rise to various nervous symptoms, rheumatic and neuralgic pains.

All grades of cardiac insufficiency may be seen in this class of patients, but the most satisfactory and suitable cases for reduction treatment are those in which slight disorders of the circulatory system are present and in which there is a moderate degree of obesity; cases in which the first signs of circulatory disease are beginning to appear. In some cases an increasing shortness of breath after slight exercise has been noticed; in other cases the only complaint may be pain in the region of the liver, gastric disturbance, or frequent nocturia, which Strauss has shown to be one of the earliest signs of beginning cardiac weakness. These cases are easily recognized, and a little physical exercise will show that the reserve force of the heart is becoming exhausted. Patients of this class are very common among our prosperous business and professional men and in women of middle age in all classes of society.

The indications for prophylaxis and treatment in this class of cases are clear and distinct. The disproportion between the fuel value of the food taken and energy output of the body must be righted, so that gradual reduction in weight will result and the work of the heart be lessened. For many years the dangers of excessive fat in acute illness have been recognized, even by the laity (as in the prognosis of acute infectious diseases, pneumonia, etc.), and Oertel has shown long ago the advantages resulting from the therapeutic measures directed toward a gradual reduction of excessive weight.

There are many who consider any attempt at reduction as weakening. This may be true of many of the "fast cures" which are extensively advertised in the popular magazines, and depend, as a rule, on purging and large doses of thyroid for their success. That it is not true of the slower method by proper diet is attested by the statements of patients who repeatedly say they feel stronger each week. In fact, if such is not the case, it is a sure indication that there is something wrong, and some feature of the case needs more investigation. The body depends largely on the proteid content of the food for its repair and growth. In the slow reduction by diet, proteid is usually allowed in amounts of 100 grams, or more, unless there are complications present, such as nephritis, when a moderate reduction may be made, if indicated.

In all these cases, without dilatation, as stated before, a high blood-pressure is found, and the question arises, what will be the effect of the reduction treatment on this? I can answer that the steady fall of blood-pressure is one of the most marked features as the patient improves. Conversely, where there is a low pressure resulting from the cardiac dilatation, the systolic pressure will rise gradually.

The greater the excess of weight, the greater the demand on the heart becomes and the smaller the surplus of reserve force to meet any unusual demand on the circulation. This is true, not only in cases of organic heart disease, but also in all conditions which impose increased work on the heart, such as arteriosclerosis, atrophic nephritis, emphysema, etc. As a rule, it is impossible to exercise any direct effect on these lesions, but in obese cases we can combat the obesity and thus save the heart considerable extra work. This enables it to devote all its energy to overcome the disastrous effects of the pathological condition present.

There are several "cures" or systems of diet in obesity which are generally known by the names of their authors. Among the more important and widely known are, The Harvey-Banting Cure, the Epstein Diet, Oertel Cure, Schweinger System, and v. Noorden's System. While differing in several particulars, principally in the various proportions of fat, carbohydrate and proteid, and in the amount of fluid allowed, still in all the principle is the same,—to reduce the total caloric value of the food taken so that the excess body fat may be used in supplying this deficiency, while protecting the general nutrition of the body. In using any set system there is always danger of trying to adapt the individual patient to the diet rather than adapting the diet to the individual's needs.

At first glance it would seem as if the technic of arranging a proper diet would be most difficult, because of the formidable array of figures representing the various percentages of food elements and caloric values. Of course a knowledge of the composition and caloric value of the more common articles of diet is necessary, but in practice it is not necessary to weigh each article and compute its caloric value and the approximate amount of fat, carbohydrate, and proteid contained in grams.

It is easy to work out some simple system so that the total caloric value of the diet is reduced, and so long as care is used in treating the individual patient so that the general nutrition does not suffer, the desired result may be attained. The patient should report at the office each week to be weighed, and the effect of the diet on the weight and general nutrition noted.

In mild cases which apply at the office for treatment a careful inquiry should be made as to the kinds and quantity of food which constitute the average daily ration of the patient. In practice I have found it advisable to have the patient keep a list of the kinds and amounts of food taken for a week and bring it to the office. Then a proper diet should be made out for that patient. In many cases all that will be needed is a slight modification in the diet, such as a limitation in the quantity of bread and butter, pastry, etc. In other cases a more strict diet will be needed. It is not the purpose to make the diet so strict that it will be tiresome to the patient.

Considerable variety should be given, and the action of the bowels improved by the liberal use of vegetables which contain from 2 to 15% of carbohydrate. Many vegetables contain less than 5% COH and can be ignored in the caloric reckoning, as the little starch content goes through the bowels with the vegetable fiber, thus escaping absorption. If these are boiled in two waters the percentage of carbohydrate is considerably lowered. The restriction in the amount of bread and butter is usually most complained of by these patients, who are, I have found as a rule, excessive bread eaters. It is my custom to allow a moderate amount of potato and to insist on at least two other vegetables, to overcome somewhat the hardship resulting from the restriction in the amount of bread. It is generally believed that potato is fattening, but that it is markedly less so than bread is readily seen when we consider its analysis. Average bread consists of P. 9, F. 1.5, COH 53.3, while potato contains P. 2, F. 0.1, COH 18. By this method the coöperation of the patient is secured, and by the time the weight has been reduced to normal limits the habits of eating have been so changed that there is little danger of former habits being resumed and the weight regained, as so frequently happens when treated under the artificial surroundings of a sanatorium where a comparatively few weeks are spent.

In severe cases with œdema absolute rest in bed should be insisted upon for one to three weeks or longer. The heart rate is slowed when the patient is lying down, and as the heart receives its blood supply during diastole, better nourishment of the heart muscle results. The blood-pressure is also lowered. If the patient is restless and the heart action rapid and tumultuous, tincture of opium should be given in 5-10 drop doses as required, as it slows the heart's action and secures rest for the patient. Sufficiently large doses of digitalis may be given to secure its physiological effects if indicated, the amount of urine excreted in 24 hours being carefully noted, since as long as this amount is increased, or at least not decreased, no accumulative action need be feared. The diet at first should consist of skim-milk, cooked fruits, and eggs. When the condition has improved the diet may be increased by adding solid food at short intervals, bearing in mind that the food must be carefully selected as to quantity and quality, so that no overloading of the digestive organs may result. As a rule, it is best to limit the fluids to the skim-milk, which in itself is a mild diuretic. It should be given in small amounts frequently. When immediate danger is past, a rigid reduction diet should be prescribed so that a rapid reduction may be obtained, for if this favorable opportunity is allowed to pass, renewed cardiac attacks may be expected soon. In the beginning a loss of 3-5 pounds a week may be obtained, but as soon as the good effects of this become evident the diet should be rearranged so that only 3-5 pounds a month are lost. After a few months' treatment more freedom in diet should be allowed, the aim being to retain the present weight for a few months. Then the diet should be again restricted so that a gradual loss of weight results. This method should be persisted in until the weight normal for that individual is reached. This may be a few pounds over or under weight as given in the various insurance tables.

The beneficent results of this method of treatment have been especially noted by the author in preventing the first signs of cardiac weakness in the slightly obese; in all cases suffering from diseases entailing an increased burden upon the circulatory system; and in the cases of extreme obesity. This is a particularly good field for prophylaxis, and it should be considered one of the most important duties of the family physician to prevent the development of obesity in all cases in which he recognizes cardiac weakness, as, for instance, valvular trouble developing from some of the acute infections of childhood, and in families which show an hereditary tendency toward obesity.

The following case reports from my cases are given to show the type of cases and results obtained by this method of treatment in suitable cases.

Case 30. Female, married, age 39, house-wife. Feb. 5, 1914.

F. H. Negative.

P. H. Muscular rheumatism five years ago, which has persisted off and on ever since. Has had during the last twelve years four attacks of "nervous prostration." Legs have swollen for a long time when she is on her feet. Said to be due to "internal varicose veins."

P. I. For the last year has been very short of breath and at times gets weak and trembles. Has to sit down. Says she feels tired all the time. Has been treated for a long time for sour stomach and gas with no relief. Complains of pain in right side under lower ribs. Nocturia three to four times. Bowels constipated. Menstrual periods regular. Flow small and pale.

Average Diet. Breakfast—cereal, bread and butter, cup of hot water. Dinner—potato, meat, bread and butter, pudding or pie. Supper—bread and butter, cake or cookies. Considerable candy between meals.

P. E. Height, 5 ft., 3 in.; weight, 183 pounds. Pulse, 80. B.P.,120. Obese. Eyes, nose, and throat, negative. Lungs, negative. Heart enlarged, apex 1 cm. outside left nipple line; at apex and base a soft systolic murmur is heard; not transmitted to left. Liver edge just below costal margin; tender. Both legs show marked edema to just below knees. Urine, pale, sp. gr., 1020; alb., 0; sugar, 0; sed. neg.

Diagnosis. Obesity; myocardial weakness with dilatation. Congestion of liver and other internal organs.

Treatment. Rest in bed; diet (skim-milk, eggs, and cooked fruits), until edema disappears. Then patient allowed up and strict reduction diet prescribed.

Outcome. July 21, 1915. Weight, 137½ pounds. Feels fine and has no shortness of breath, pain in side, or stomach symptoms. No nocturia. Walked to-day from her house to office, a distance of 1½ miles.

Case 50. **Female, married, age 60, house-wife; seen Jan. 18, 1914.**

F. H. Father died of heart trouble, mother dead, age 65, cause not known; one brother living and well, one sister living but has heart trouble, one brother died of asthma and dropsy.

P. H. Has always been well until within the past four or five years, when she began to have a cough and frequent attacks of bronchitis; scarlet fever, mumps and pertussis as a child.

P. I. Comes in because of cough which has persisted most of the time for four or five years and is much worse at present. Raises considerable white sputum but never any blood. Cough is worse at night and whenever she gets tired. Has been moving the past week and has done considerable extra work. At present has some distress in stomach, and at times considerable gas. Distress not made worse by eating and is relieved by rest. Has noticed that she is growing more short of breath recently. Appetite good. Bowels are regular.

P. E. Weight, 182½ pounds; height, 5 ft. 5½ in. Pulse, 80. B. P. (s), 140.

Head, neck and throat negative.

Chest—Lungs show many "wheezes" and a few râles, mostly at the bases, posteriorly.

Heart—Area not determined because of excessive fat. First sound, faint and short. Soft systolic murmur at the apex. Action regular but somewhat rapid.

Abdomen—Full, soft, no masses or tender areas.

Liver edge felt about three fingers below costal margin.

Spleen not felt. No fluid.

Ext.—Moderate edema of lower legs.

Urine—Sp. gr., 1020. Alb. s. p. t. Sugar, 0. Sed. negative.

Diagnosis. Obesity; myocardial weakness with dilatation; chronic endocarditis (?); congestion of the liver.

Treatment. Rest in bed until edema is gone.

Diet (skim-milk, eggs, cooked fruit).

Outcome. Jan. 16, 1916. Weight, 155 pounds. B. P., 160.

Feels fine and has no cough or dyspnœa. Has had no swelling of legs for several months. There is a moderate systolic murmur at the apex of heart, much more distinct than at first examination.

Case 42. Male, age 52, salesman; seen Sept. 10, 1914.

F. H. Negative.

P. H. Has always been well except for pneumonia about 39 years ago; good recovery.

P. I. Comes in because of shortness of breath which has been growing worse for the last three to four years. Recently has had more cough, which is worse at night unless head is high. Any exertion makes breathing worse and is very apt to cause coughing. Thinks ankles have swollen a little lately. At times raises considerable sputum, and once or twice thinks he has seen little streaks of blood. Appetite good. Bowels are regular.

P. E. Weight, 177½ pounds; height, 5 ft. 6 in. B. P., 200. Pulse, 77.

Head, neck and throat negative.

Chest—Thorax moderately emphysematous. Lungs show a few squeaks scattered throughout both sides.

Heart—Area enlarged to the left and right. Regular and sounds distinct. At apex a systolic murmur is heard which is transmitted to the left.

Abdomen—Negative.

Urine—Sp. gr., 1022. Alb. s. p. t. Sugar, 0. Sed. negative.

Ext.—Slight pitting on pressure, over tibia.

Diagnosis. Obesity, emphysema, chronic endocarditis, nephritis (?).

Treatment. Reduction diet.

Outcome. March 20, 1916. Weight, 147 pounds. B. P., 164.

Feels fine and has no cough or shortness of breath, except on vigorous exertion. Cardiac area and sounds unchanged.

Case 35. Female, married, age 49, house-wife; seen Oct. 18, 1915.

F. H. Father dead, accident; mother dead, childbirth; two brothers and one sister living and well.

P. H. Has had six children, all normal labors; has had frequent and severe attacks of tonsillitis all her life; scarlet fever, pertussis, measles in childhood.

P. I. Comes in for shortness of breath and swelling of legs which began about eight years ago and has steadily increased despite varied and vigorous treatment.

P. E. Weight, 183½ pounds; height, 5 ft. 3 in. Pulse, 80. B. P., 180.

Head and neck negative. Throat shows large and ragged tonsils, the crypts of which are filled with cheesy material. Pillars reddened.

Chest—Negative except for poor expansion.

Heart—Area enlarged; blowing systolic at the apex transmitted to the left. Regular and moderately rapid.

Abdomen—Liver edge felt about two fingers below costal margin.

Ext.—Marked edema of lower legs.

Urine—Sp. gr., 1028. Alb. s.t. Sugar, 0. Sed., rare hyaline cast.

Diagnosis. Obesity; chronic endocarditis; cryptic tonsils.

Treatment. Removal of tonsils advised but refused.

Reduction diet.

Rest in bed until edema gone.

Outcome. Feb. 10, 1916. Weight, 159½ pounds.

Feels fine and has no edema of legs; no shortness of breath; walked to-day from her home to office, a distance of about one mile, easily.

Case 54. Female, married, age 58. One child. Nov. 27, 1914.

F. H. Father died of heart trouble, dropsy. Mother died of kidney trouble. One sister living, Bright's disease.

P. H. Always has been well except for attacks of severe colic which began about six months after birth of child, and has recurred at intervals ever since.

P. I. Comes in because of shortness of breath, which has been increasing for the past few years. Has considerable regurgitation of sour, bitter fluid into mouth. Appetite is good. Bowels constipated; has been gaining in weight considerably for the past few years.

P. E. Weight, 199½ pounds; height, 5 ft. 3 in. B. P. (s.) 240, (d.) 115.

Head, neck and tongue negative.

Chest—Negative.

Heart—Area enlarged, action regular, systolic murmur at apex.

Abdomen—Liver palpated about two fingers below costal margin. Slight distress in region of gall-bladder.

Ext.—Moderate edema.

Urine—Sp. gr., 1020. Alb. s.t. Sugar, 0; Sed., many hyaline and granular casts.

Diagnosis. Obesity, chronic endocarditis; chronic nephritis, gallstones (?).

Treatment—Rest in bed, reduction diet. Epsom salts as required to keep bowels active.

Outcome. March 24, 1916. Weight, 163 pounds. Breathing fine, still has considerable stomach distress at times. Heart area and murmur unchanged. Urine examination, many hyaline and granular casts. Edema of legs. B. P., 180.

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JEAN-PIERRE DAVID: THE MAN WHO POTTED POTT.

BY JOHN RIDLON, M.D., CHICAGO.

IN the BOSTON MEDICAL AND SURGICAL JOURNAL of June 3, 1915, Dr. R. W. Lovett presented an appreciation of "Percival Pott: His Times and His Work."

Pott lived when "quackery was rampant." If we may judge him by his paper on "Palsey of the Lower Limbs, Which is Frequently Found to Accompany Curvature of the Spine," he did not escape the taint of his times. Then, as now, a quack may become preëminent; then, as now, a learned and skillful practitioner of medicine or surgery may become preëminent; but the learned and skillful practitioner of medicine or surgery who happens to be born with the instincts of a quack has all others out of the running.

In his time Pott was counted a skillful surgeon —"Surgeon to St. Bartholomew's Hospital during forty years." His writings on hernia, head injuries, hydrocele, fistula in ano, and fractures and dislocations, have been forgotten for more than a century; the three things that have come down to us, after 138 years, are: that he broke his ankle going to Southwark; bought a door and had himself carried home on it; and wrote the paper above mentioned on palsy of the lower limbs, which gave his name to caries of the spine, of the treatment of which he appears to have been profoundly ignorant.

The knowledge which Hippocrates had 400 B. C., the knowledge which Galen had in the second century and the knowledge which Paré had in the sixteenth century, A.D., and the work which was then being done in Paris all passed him by.

It is generally supposed, and often stated, that Pott *first* described Pott's disease. Nothing could be further from the truth. He did not even describe the disease in his paper on palsy. He does not appear to have recognized any difference in the causative effect of kyphosis, scoliosis and lordosis on the production of the palsy, or to know that there is such a thing as caries of the vertebrae, or that it had really anything to do with the palsy he writes about. All he appears to have aimed at was to get his new method of treatment into print before any other practitioner heard of it and forestalled him.

And what was this wonderful treatment? It was to cut a gash or burn a hole in the meat on each side of the spine, place therein a kidney bean, and every third day, sprinkle into the wound some finely powdered Spanish flies to ensure keeping the sore open and discharging abundantly! He ignored the fact that this treatment kept the patient in bed, and kept him lying on his face in the most favorable position for the cure of the caries of the vertebral bodies. He does not even give a good clinical description of the palsy (see Lovett's quotations). He was sure that the arms were never affected, and he recognized sensory disturbances, particularly in the thighs, before any motor disturbances appeared. He did not know that the reflexes were changed.

He recognized an early enlargement of the vertebral bodies and some change in their structure, but he does not appear to have recognized this as a diseased condition—only as a condition preceding caries. But when caries had developed, Pott looked upon the case as hopeless. He says: "That if from inattention, from length of time, or any other circumstances, it happens that the bodies of the vertebrae have become completely carious, and the intervening cartilages are destroyed, no assistance is to be expected from the proposed remedy." He unhesitatingly asserts that the placing of setons and issues at each side of the kyphotic spine will cause the kyphos to straighten, or at least become straighter, and the patient taller. To quote: "I have waited a sufficient length of time, and treated a sufficient number of subjects to be clear in the truth of what I have asserted as far as such time, and such individuals go. That the patients whom I have attended in the early part of the distemper, of whatever age, have all got well; that is, have all not only regained the use of their legs, but have become healthy and fit for any exercise or labor, as numbers can testify who have seen them daily. Most of them have become much straighter, some quite straight, and all of them perfectly free from all kinds of inconvenience arising from the curve." Again: "That as far as my experience goes, I have not the least doubt that if the means proposed be made use of before the bones are become really carious and rotten, they will always be successful. When, indeed, a truly rotten state of the bones takes place, no good is to be expected from this or from anything else; but it should be observed, at the same time, that this never happens but when the distemper is of very old date and when this is the case, the whole machine is disordered and the patient is so truly and so generally distempered that there can be no reasonable expectation from anything."

The cry of Pott is the cry of the quack of all times: "I can cure all curable diseases by my wonderful treatment. Cases that cannot be cured by my treatment cannot be cured by any treatment whatsoever."

Now attend to what Jean-Pierre David, whose prize essay was published in Paris the year before Pott wrote, has to say regarding caries of the spine.

Discussing the rationale of the treatment of fractures by rest, he says: "But there are many other cases in which nature appears to have the same views as in fractures and in which the indications for rest are as precise as in these accidents."

His first case of "Pott's disease"(!) he saw in 1766, and describes as follows: "Having been violently beaten, at the age of 13, by his father, he felt, a few months after, a weakness in the spine, attended with pain and difficulty in keeping the upright posture. He walked with great difficulty, and afterwards could not walk without leaning upon a stick, with his body bent forward. These first symptoms, which continued for more than six months, were followed by a fever accompanied with difficulty of breathing, and pain in the middle of the back, without any apparent swelling externally.

"These symptoms were relieved by bleeding and other remedies and the patient seemed restored to his former state, but the difficulty of walking and supporting himself increased by degrees, and at length a tumor was formed toward the lateral and posterior part of the last false ribs, the increase of which was very slow, and made no change in the colour of the skin.

"This tumor, extending itself, gained the region of the loins, and more than six months after its appearance, the skin became inflamed, grew thin and, by the assistance of maturating poultices applied to the tumor, a fistulous opening was made in it from which there issued, according to the patient's account, more than a quart of matter as white as milk. The discharge having continued very plentiful for three months without hope of cure, the parents, tired with the length of the disease, took the resolution of sending the young lad to the Hospital. When he came there he had a fistulous opening on the right side of the lumbar region which furnished an ichorous and plentiful discharge; a slow suppurating fever accompanied, and every appearance seemed to shew that death would soon terminate this disorder. A pledget of soft ointment only was put upon the fistulous orifice, and the disease was left to nature.

"I frequently saw this patient, who, being better fed and more attended than at home, began to recover a little from the deplorable state to which he had been reduced. He particularly kept very quiet in his bed, and his spine was then incurvated with an evident projection outwards, towards the last dorsal vertebra. About two months after he came to the Hospital, the matter which oozed from the fistulous opening grew thicker and less plentiful, the countenance appeared better, the pulse less frequent, and he began to give some hope of recovery. This hope was confirmed six weeks afterward, for the discharge still lessened, and the patient began to feel some degree of strength in his spine. Two months after this last period, the fistulous orifice was closed, and the patient began to walk with a stick; but he was crooked, and seemed to have lost much of his former height.

"From the accidents this patient had undergone, and the deformity the spine had contracted during the course of the disease, I imagined that some of the dorsal vertebrae had been affected with caries; that the remains of them, after having been confounded together and after having been in a state of granulation, had at length acquired a degree of solidity sufficient, in some sort, to supply the bodies of these bones. I could not but consider rest as having been the chief promoter of this salutary end; and the subsequent facts appear to have completely confirmed my conjectures on this point.

"First, the patient who had been the subject of the preceding observation, and whom I had always kept within my notice, having been seized, in 1769, with a peripneumony of which he died, I was allowed to inspect the body, and my first care was to take notice of the disorders the spine had experienced three years before. I found, as I expected, several vertebrae, the bodies of which were confounded with each other; these were the ninth, tenth and eleventh of the dorsal vertebrae, which had lost at least half of their longitudinal dimensions, while their spinal processes, which had not suffered the least alteration, formed a projection and a remarkable convexity outwards."

David then goes on clearly to differentiate these cases of kyphosis from cases of lateral curvature, and to point out how those cases of kyphosis accompanied by abscesses never recover until "after a long-continued rest," to enable the affected parts to gain "a sufficient degree of solidity." We should wait "till, by rest and a horizontal position, the pieces that compose the column shall have lost that morbid state of softness which has disposed them to be thrown out."

He then describes cases of spondylitis in the lumbar region with abscesses passing down underneath Poupart's ligament, or into the ischiatic foramen.

As to the frequently accompanying abscesses, he says, "The surgeon who makes this opening and who sees that he has given issue to a great quantity of matter, confined for a long time in swellings of this kind, congratulates himself upon an event which he thinks cannot but turn out for the good of his patient; but the patient, who for some months past had experienced no evident degree of fever, who suffered but little, who had perhaps preserved his appetite, who slept, and who had complained of no other symptom but that he could not keep his back upright, is far from being relieved by this operation, at least if he be, the relief is not of long continuance; for the matter forming the tumor, which at the time of the opening was as white as milk and without smell, soon contracts a considerable stench, a fever comes on, the pulse becomes quick and small, and the patients pretty frequently die towards the thirteenth day."

David knew that these abscesses, when left alone, and the patient put at rest, would not infrequently disappear; and he reports such a case, a young woman with caries in the lumbar region, who had a psoas abscess with a tumor the size of one's fist below Poupart's ligament. Under treatment by rest the abscess disappeared without opening. He knew that so long as "the matter is still sheltered from the external air, and undergoing no change, produces no mischief in the parts surrounding it." He knew that the slow evacuation (by spontaneous opening) or absorption of the matter, "as slowly as its collection was formed, the parts which compose the cavity must return to their proper state as gradually as they were disturbed from it, without accident and without inconvenience."

"With respect to the bones that are primarily affected, and which have almost adopted the nature of flesh during the long and important process of exfoliation, no sooner are they disengaged from the loose pieces than they begin to recover their solidity; and if several vertebrae ....have partaken of the injury, they form among themselves a common mass of ossification that in some measure supplies their bodies, and terminates this important cure, which, as we may observe, can only be the work of nature, time and rest."

And now after the lapse of 138 years, who has given, who can give, a more illuminating picture of spinal caries? As to the treatment of the disease, and its complications, we may differ from David and from each other in minor details, but the broad general principles of the treatment have in no way been added to or altered.

Placed side by side with Jean-Pierre David, the real man, Percival Pott, with his setons and issues, his kidney-beans and finely powdered cantharides, bulks very small and a very pathetic figure.

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London Death Rates in July.—Statistics recently published show that the total death rate of London for July, 1916, was only 10.7 per 1.000 inhabitants living. Among the several districts and boroughs the highest rate was 14.8 in Holborn, and the lowest was 7.7 in Wandsworth.

Clinical Department.

REPORT ON THE CLINICAL SYMPTOMATOLOGY AND LABORATORY FINDINGS IN THREE CASES OF GENERAL PARESIS UNDER INTRAVENOUS ARSENOBENZOL TREATMENT.*

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Mr. President and Fellow Members of the Worcester District Medical Association:

The recent increase of literature on the subject of syphilis and its action upon the nervous system, together with the results obtained from the intensive treatment of salvarsan now being practised in our state hospitals for the insane and at a number of the larger general hospitals, suggest that a brief presentation of the history, symptomology and laboratory findings in three cases here under treatment for the past three months will be of interest at this meeting of the Worcester District Medical Society.

Most of the cases of central neural syphilis in this state are classified as general paresis. The percentage of admissions of this disease to our state hospitals for Massachusetts has been given at 9%.

Hitherto the diagnosis of general paresis has been made upon the appearance of such classical symptoms as the Argyll-Robertson pupil, altered knee-jerks, ataxia, loss of judgment, emotional instability, etc. The diagnosis was confirmed by the well known Wassermann reactions in the blood and spinal fluid.

We have come to look for the following six laboratory tests in confirmation of the diagnosis of general paresis:

1. Positive colloidal gold reaction of Lange (gold chloride test).
2. Globulin—present and increased, Noguchi —butyric acid method.
3. Albumen—present and increased.
4. Number of lymphocytes per c. m. increased from 10 to 400.
5. Wassermann reaction in blood serum.
6. Wassermann reaction in spinal fluid.

It is interesting to note that practically nothing is known of the reactions of the spinal fluid prior to the onset of the clinical symptoms of general paresis. Recent work by Southard and other observers, however, tends to show that the six positive laboratory findings for general paresis are present months, and perhaps years, before the appearance of the classical clinical symptoms. With these findings in view, spinal punctures, as well as the regular blood serum tests, are fast becoming routine procedure.

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* Read before the Worcester District Medical Society on March 8, 1916.

Moore, in his translation of Kraepelin's discussion of general paresis in the last edition of his text-book, states, "The actual beginning of paresis consists, as a rule, of rather indefinite symptoms which are usually interpreted as nervousness. They are apt to be excitability, a hasty, irritable, whining manner, anxiety states, absentmindedness, fatigability, mental dulness, forgetfulness, a tendency to sleep or persistent sleeplessness. Accompanying these are headaches, migraine with scotomata and vomiting, giddiness, cardiac palpitation, excessive sweating, rheumatoid pains, numb feelings, muscle twitchings, writer's cramp, brief weaknesses, abdominal cramps and intestinal obstruction. In the further course, the mental and physical symptoms may progress collectively or individually with very irregular rapidity. Thus there are cases in which even severe disturbance of speech and writing, with tabetic signs and lost reflexes, may exist for a long time before any marked involvement of memory or intellect can be discovered. On the other hand, the mental symptoms may be fairly prominent while physical examination reveals at first only indefinite and non-characteristic changes. This fact furnishes a wide opportunity for errors in either direction, before the cytological, and especially the serological tests afforded us a means of verifying our opinion even in the earliest stage of the disease."

With these points in mind, I will briefly give the chief facts in the histories of three cases of general paresis now under treatment with salvarsan.

This treatment was recommended by the Massachusetts State Board of Insanity. As salvarsan was not on the market, the Canadian preparation, diarsenol, was used until the cheaper price of the Philadelphia Dermatological Laboratory's product, arsenobenzol, made its use advisable.

The drug has been given bi-weekly, intravenously, in the arms. Following the earlier treatments a distinct reaction occurred,—chills, fever, headache, nausea, and vomiting. The most constant symptom was a nervous chill lasting from ten to twenty minutes and appearing from ten to thirty minutes after treatment.

Some local infiltration and organization has been caused by leaking of drug during administration, but these discomforts have readily yielded to application of ice and massage. Some variability in the acidity of the drug has been noted. Frequent urinalyses have shown only occasional traces of albumen in case of T. H. The body weights have shown scarcely any variation during the past three months.

CASE 29742, G. H. D. Patient is a French Canadian, age 38, white, single social state, Roman Catholic religion. In the United States 30 years. The family history states that the father died of accident, mother of shock at age of 72, one brother of pulmonary tuberculosis, six sisters living and well.

Personal History. Early life unimportant. In school 11 years. Employed as a mill hand. Was steady and efficient, well liked, always well and enjoyed a happy disposition. Used alcohol moderately. Never arrested for drinking. Onset of present trouble began about Sept. 17, 1915. Complained about his heart. Returned medicine prescribed by physician to doctor claiming that the latter had drugged him. Later claimed that his relatives were drugging his food and for this reason stopped eating. Was hallucinated, talking to himself, saying that he could hear little fairies. Saw them flying around and sitting beside him. Regularly committed to the Worcester State Hospital, Oct. 4, 1915. Physician's certificate described him as both excited and depressed at times; as suffering from delusions of persecution. Claimed that members of the Lowell police force had been after him for six weeks; that a medicine with nine hundred and a half grains of poison had been given to him; that he had seen his death certificate signed, and that $500 as a bribe had been offered to somebody to secure his death. Further described as troubled with insomnia. On admission to hospital, interview found him approximately oriented, with well marked ideas of poisoning, acute auditory and visual hallucinations for the past two weeks. These hallucinations were highly suggestive of alcoholic influence, and this fact, together with the admission that he had been drinking regularly three glasses of beer before, and perhaps from four to seven glasses after, supper daily, led to the diagnosis of alcoholic hallucinosis in a case of general paresis. In addition to the foregoing hallucinations, patient complained that he had a feeling that little fairies were about him—"they feel like little pin pricks"—suggested impairment of tactile sensations. During the earlier part of his residence he was very suspicious in attitude and seemed apprehensive of some harm coming to him. By degrees his hallucinatory episode abated, his attitude became more sociable and he adjusted himself to his surroundings, although remaining somewhat slovenly in his dress and habits. Following treatment of salvarsan he seemed to improve until February 22, when he flatly refused further treatment. A change in his conduct occurred on February 19, when he began to act peculiarly—appeared depressed, was noticed kneeling about the ward in attitude of prayer, was mute to all questions and would not coöperate with even such simple procedures as the taking of his temperature.

Physical and Neurological Examination. The skin showed copper point discolorations, entire body covered with papillomata ranging in size from a pea to a horse chestnut. Glands slightly enlarged in groin, axillary and cervical chain. Mucous membranes pale. Pupils unequal—right larger than left, right does not react well to light. Slight exaggeration of the deep reflexes; coarse, rapid, irregular tremor of extended hands. Percussion note impaired over bases of lungs posteriorly. Slight radial arteriosclerosis—blood pressure 135. Varicose veins posterior surfaces of both legs. Small linear scar on glans. Urinalysis shows slight trace of albumen. Specific gravity 1.035. No pathological reflexes.

Treatment. Total arsenic drug equals 4.8 gram.

a. *Diarsenol.*
From January 5, 1916, to January 21, 1916, 6 intravenous injections (alternating arms) of diarsenol, given bi-weekly in doses varying from 0.3 gram to 0.6 gram—total of 2.7 grams of diarsenol.

b. *Arsenobenzol.*
From February 2, 1916, to February 18, inclusive, four intravenous injections (alternating arms) of American preparation, arsenobenzol, in doses varying from 0.3 to 0.6 gram—Total of 2.1 grams arsenobenzol.

Patient has steadfastly refused treatment from February 22 to present date. (Repeated punctures on account of small calibre of veins found necessary causing patient to grow discouraged and irritable. When told of his negative laboratory findings with idea of encouragement, he decided that he was cured.)

Laboratory Findings:

a. *Wassermann Reactions in Blood Sera.*
From October 13, 1915, to January 25, 1916, inclusive, 6 positive reactions reported by the State Department of Health laboratory.
February 7, 1916, negative reaction.
February 18, 1916, negative reaction.
February 25, 1916, doubtful reaction.

b. *Wassermann Reactions in Spinal Fluid.*
Nov. 10, 1915, positive reaction.
Feb. 17, 1916, unsatisfactory reaction.

c. *Spinal Fluid Examinations.*

1. Gold Chloride Test.
   Nov. 8, 1915: 1-1-2-1-±-±-±-0-0-0—positive?
   Feb. 14, 1916: 3-2-2-±-0-0-0-0-0-0—positive.
2. Cytological Count.
   Nov. 8, 1915, fresh fluid clear—cells per c. m. equals 125.
   Feb. 14, 1916, fresh fluid clear—cells per c. m. equals 3.
3. Albumen Test.
   Nov. 8, 1915, plus, plus, plus.
   Feb. 14, 1916, plus.
4. Globulin Tests.
   Nov. 8, 1915, Ross-Jones test plus. Noguchi test plus.
   Feb. 14, 1916, Ross-Jones test plus. Noguchi test plus.

Case 29578, A. B. A man aged 36, Italian, in the United States 10 years. A waiter by occupation. Successful in business. Committed to the hospital on June 18, 1915. The committing physicians gave the onset of present attack about June 1, 1915, describing the patient as suffering from expansive and grandiose ideas (patient said he had about two hundred billion dollars and that he was going to give it to everybody that wanted it; that he was going to build restaurants and feed the poor people). Patient was further described as suffering from insomnia, excitement and talking garrulously. The family history states that one paternal uncle died of tumor of the brain. Patient is said to have been nursed by a woman who later died of syphilitic infection. The personal history credits the patient with little education, describes him as thrifty and saving, drank liquor moderately. Married April, 1914. One child born January 25, 1915. The onset of his present trouble is said to have been sudden, occurring June 1, 1915, when he had some slight trouble with his employer, gave up his job, developed extravagant ideas, was talkative and excited and was sent to the Psychopathic Hospital, June 8, 1915.

On admission to this hospital he was noisy, excited, crying, showed loss of emotional control, hoarse from excessive use of voice, had a temperature of 101.2, pulse 90, respiration 20. Admitted contraction of syphilis about 20 years ago at Glasgow, Scotland, where he received treatment every week for a year, of mercury and potassium iodide. The doctor told him that he was cured. Five years later troubled with a sore upon his head; ten years ago in Boston, a right-sided bubo appeared and was treated surgically. Something over a year ago he desired to get married, and had his blood examined. A positive Wassermann was reported. He therefore took mercurial injections four times a week to the number of 106. The injections were given intramuscularly in the back; all of this treatment is based upon statements of the patient. In his capacity as waiter he claims to have accumulated $12,000. About the middle of May, 1915, patient stated that he experienced a feeling of strange elation, thought that he would like to buy a theatre and wanted to buy everything to help humanity. Thought that the Boston Psychopathic Hospital was a present to him. During fifteen days he thought that he was boss and undertook to run the place. In his dreams he talked with his father and mother. During the next two months patient was highly excited, engaged in destructive acts, such as tearing his clothing and bedding, digging into the plaster of the walls of his room, taking the springs from his bed to make keys, successfully picked one or two locks, stole spoons and other metal articles to furnish material for his keys. During this period he required frequent sedatives to relieve noisy insomnia. Following this there was an improvement for about a month, followed by a relapse of two months. About January 1, 1916, he was transferred to Gage Hall 2, where he was a great trial to the attendants until he came under the influence of the salvarsan treatment. At the present time he reacts quite naturally to his surroundings and shows a remarkable general, clinical improvement.

A physical and neurological examination at time of admission showed some bruises and discolorations following violent activities preceding admission. General feeling of exaltation, Argyll-Robertson pupils. Irregular, rapid tremor of extended fingers, gelatinous tremor of the tongue margin. Some slight pulmonic changes. Blood pressure 150. A slight discoloration at coronal border of the genitals. Urinalysis was negative.

Treatment. Total arsenic drug equals 9 grams.

a. *Diarsenol.*
From Jan. 5, 1916, to Jan. 18, inclusive, 5 intravenous injections. Total, 2.1 grams.

b. *Arsenobenzol.*
From Jan. 21, 1916, to March 7, 1916, inclusive, 12 intravenous injections. Total, 6.9 grams.

Laboratory Findings.

a. *Wassermann Reactions in Blood Sera.*
From July 9, 1915, to Feb. 18, inclusive, 12 positive reactions reported by the State Department of Health Laboratory.
Feb. 25. Unsatisfactory reaction.
March 4. Positive reaction.
March 4. Positive reaction.

b. *Wassermann Reactions in Spinal Fluid.*
  July 16, 1915. Positive reaction.
  Jan. 27, 1916. Positive reaction.
  March 1, 1916. Positive reaction.
c. *Spinal Fluid Examinations.*
  1. Gold Chloride Test.
    Jan. 24, 1916. 5-5-5-5-5-3-2-1-±-±—positive.
    Feb. 28, 1916. 5-4-3-4-2-2-0-0-0-0—positive.
  2. Cytological Count.
    Jan. 24. Fluid too bloody.
    Feb. 28. Cells per c. m. clear fluid, 3.
  3. Albumen Test.
    Jan. 24, 1916. Plus, plus, plus.
    Feb. 28, 1916. Plus, plus, plus.
  4. Globulin Test.
    Jan. 24, 1916. Ross-Jones test positive. Noguchi, positive.
    Feb. 28, 1916. Ross-Jones test, plus, plus. Noguchi, plus, plus.

Case 29461, T. H. A man aged 48, native American of Irish parentage. Plumber and professional baseball player by occupation. Civil condition, married. He was committed to this hospital on March 18, 1915. The physicians' certificate describing patient as cleanly, talking incessantly and boisterously, ideas of exaltation, expressing queer moral and religious ideas, marked insomnia, with "hallucinations of business deals." The family history is negative to insanity. The personal history furnishes a record of excessive use of alcohol from age of 19 to 43. Successful in his business. Married six years ago. No children. Had reputation for drinking and carousing while in baseball company. Generous and jolly in disposition. Venereal history unknown. The onset occurred about March, 1914. Began with nervousness and insomnia—six months ago considered taking a rest for nervous breakdown. Talked about big business deals. Eight days ago became excited, talkative and his conversation showed repetition. A physical and neurological examination showed a geographic tongue; right naso-labial fold more marked than the left. General feeling of well being. Pupils are equal and regular, but react sluggishly through a small arc to light. The right hand grasp is a little stronger than the left. Walks on a wide base. Reflexes exaggerated throughout. Knee-jerks third degree. Slight radial sclerosis. Blood pressure 148. Pyorrhea alveolaris. No genital scars. Urinalysis negative.

In the early part of his hospital residence, he was noisy, loud talking, distractible, generally excited and garrulous, showed pressure of activity, restless in his room, lack of judgment, rambling and boastful in conversation, full of explanations which failed to explain. Later he quieted down but remained emotionally unstable, with impaired judgment, tendency to fabrication, talkative, voluble, expansive and grandiose in his ideas. Admits venereal infection about six years ago.

On May 18, he was recorded as reacting to auditory hallucinations, talking to imaginary friends outside of his window. Disoriented for time, excited, elated, at times aggressive and violent, requiring the use of sedatives. By November, 1915, he had quieted down and had gained sufficient self-control to live in Lincoln 1.

Treatment. Total arsenic drug equals 8.7 grams.
a. *Diarsenol.*
  From Jan. 5, 1916, to Jan. 21, inclusive, 6 intravenous injections. Total, 2.7 grams.
b. *Arsenobenzol.*
  From Jan. 25, 1916, to March 7, 1916, inclusive, 11 intravenous injections, total 6 grams.

Laboratory Findings.
a. *Wassermann Reactions in Blood Sera.*
  From Jan. 6, 1916, to Feb. 5, inclusive, 8 positive reactions reported by State Department of Health Laboratory.
  Feb. 7. Negative reaction.
  Feb. 18. Positive reaction.
  Feb. 25. Unsatisfactory reaction.
  March 3. Positive reaction.
  March 4. Positive reaction.
b. *Wassermann Reactions in Spinal Fluid.*
  March 24, 1915. Positive reaction.
  March 3, 1916. Positive reaction.
c. *Spinal Fluid Examinations.*
  1. Gold Chloride Test.
    Jan. 24, 1916. 4-4-3-4-4-3-2-1-±-±—positive.
    Feb. 28. ±-±-1-1-±-0-0-0-0-0-0—weak positive.
  2. Cytological Count.
    Jan. 24. Spinal fluid too bloody.
    Feb. 28. Cells per c. m. in fresh fluid, 6.
  3. Albumen Test.
    Jan. 24. Plus, plus, plus.
    Feb. 28. Plus, plus.
  4. Globulin Test.
    Jan. 24. Ross-Jones, positive. Noguchi test, positive.
    Feb. 28 Ross-Jones, plus. Noguchi test, plus.

Briefly summarizing the foregoing three cases:

1. The onset of the disease, as determined by statements of physicians, relatives and of the patient himself, occurred as follows:

In one case, ten days prior to commitment.

In another case, fifteen days prior to commitment.

In still another, one year.

In the light of subsequent treatment, early diagnosis of general paresis, or at least of syphilitic involvement of the central nervous system, is of the utmost importance. Other observers, as I have already tried to point out, have shown that a much earlier diagnosis can be reached through persistent and thorough laboratory examinations than from the appearance of consistent clinical symptomatology.

Following treatment:

2. Definite clinical improvement has occurred in two of the patients. One patient has shown resistiveness and lack of coöperation to such an extent as to classify him as not improved.

3. Definite results in the laboratory findings:
  a. Gold chloride test, although still positive, much reduced in two cases. Slightly increased in the case refusing treatment.
  b. Albumen tests reduced in all three cases from three pluses to one plus.
  c. Globulin tests, slightly increased in

one case; unchanged in other two cases.

d. Cytological count reduced in one case from 125 to 3 cells per c. m. Low normal count in both of the other cases (3 cells in one, 6 cells in the other).

e. Wassermann reaction in spinal fluid: In one case from positive to unsatisfactory—Nov. 10 to Feb. 17 (case of G. H. D.).
In other two cases unchanged, remaining positive.

f. Wassermann reaction in blood sera: Showed three negatives and one doubtful reaction in one case (G. H. D.).
One unsatisfactory reaction in case of A. B.
One negative, one unsatisfactory, and all other reactions positive in case of T. H.

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Medical Progress.

ELEVENTH REPORT OF PROGRESS IN ORTHOPAEDIC SURGERY.

By Robert B. Osgood, M.D., Robert Soutter, M.D., Hermann Bucholz, M.D., Harry C. Low, M.D., Murray S. Danforth, M.D., Boston.

(Concluded from page 314.)

RICKETS (*Continued*).

Lovett[26] has made a careful study of between 600 and 700 roentgenograms of rickets taken from between 7000 and 8000 roentgenograms at the Children's Hospital, Boston. Thus rickets constituted about 9% of their total plates. We give a fairly complete review of this article, which seems to us of much value. In this study he found the cases divided themselves into three groups or stages, with fairly well marked characteristics. Of the first stage there were two types: 1. The mild type, in which the ends of the diaphysis become frayed out, instead of clear cut, and the epiphysis casts little or no shadow, while the centre of ossification is small or absent, and at times appears multiple. The whole joint is surrounded by a hazy cloud, and the diaphysis on the whole contains less lime than normal. Up to this point deformities have not begun. 2. In the severer type the epiphyseal appearances are similar, but more marked. In the diaphysis severe general bone atrophy exists, and there is pronounced periosteal thickening associated as a rule with fracture of the bones, most often in the arms. These cases of multiple fracture are very common. In the second stage the shadow of the epiphysis becomes more marked. The area is ragged and irregular about the margin and calcification is more marked at some points than others, which results in a characteristic mottled appearance. The ends of the diaphysis begin to broaden, especially on the side on which the strain is greatest, which produces a ledge or lip next to the epiphyseal line. In bow-legs this is found on the inner side of the tibia and femur, and in knock-knee on the outer side of the same bones. The diaphysis in the second stage begins to give a more definite shadow. The region next to the epiphysis is striated longitudinally and is the area of maximum disturbance. At the epiphyseal end of the shaft there is generally a transverse area of increased density reaching about a quarter or a half inch from the epiphyseal line, bounded at the end farthest from the joint by a fairly sharp line. This continues into the third stage, in which it may become more defined, and resembles in many respects similar changes in syphilitic bones in infants, described as osteochondritis. At the end of the diaphysis next to the epiphyseal line, there often appears in the late second or early third stage a clear transverse white line, showing an increased deposit of lime in the lower end of the shaft. This is apparently not to be distinguished from the "white line" which is described as characteristic of scurvy, but which is equally characteristic of rickets. A longitudinal change occurs along the shaft of long bones, consisting of cortical thickening on the concave side of the bones. This is one of the most important characteristics in differential diagnosis. Further changes in this stage consist in "chambering" of the interior of the bone, where light areas in the shaft indicate the absence of marked bone deposit and heavier lines of ossification show the irregular development of trabeculae. In the third stage the epiphysis is more normal in contour and density, the lipping of the diaphysis persists, and there is a consequent discrepancy between the diameter of the diaphysis near the epiphyseal line and the epiphysis. This relative difference in size is characteristic of the disease. The shaft becomes more dense, and its compensatory thickening on the concave side of the curvature persists. Under differential diagnosis, the author states that in scurvy, while there may be marked changes in the diaphysis, the epiphysis shows a clear outline. This, too, is true in chondrodystrophia fetalis, also in hereditary osteogenesis imperfecta. The roentgenographic diagnosis of rickets and congenital syphilis is the most uncertain. Here again the difference in the appearance of the epiphysis in the two conditions is most important. In syphilis the epiphysis is not clouded and its outline is clear, while there is in syphilis marked cloudiness about the joint, which is not the case in rickets. Extensive periosteal changes are common to the two diseases. In the severe type of acute rickets, severe periosteal thickening, very frequently associated with fracture, is found. Such periosteal disturbances diminish with the progress of the disease and show no tendency to bone formation, such as is the case in the periostitis ossificans of syphilis. Moreover, fractures are rare in syphilitic infants. The irregularities in the medullary shadow of the shaft in syphilis are due to irregular increase in density. The irregularities in rickets are related primarily to diminished density. In the later stages of both diseases the occurrence of cortical thickening is highly differential. In rickets the thickening is endosteal in origin, and is always on the concave side of the curve, while in syphilis the thickening is periosteal or osteoperiosteal and is very uniformly on the convex side of the curve. Lovett considers that osteotomies should not be done during the active stage, but only when the epiphysis presents a rounded clear outline.

CONGENITAL DEFORMITIES.

Anteversion of the Neck of the Femur in Connection with Congenital Dislocation of the Hip.

Hibbs[27] calls attention to this deformity of the femur as a cause of failure to cure certain cases of congenital dislocation of the hip. He determines the condition by roentgenograms of the hip, one taken with the patella and foot directed straight forwards, and one with the limb internally rotated. To correct this anteversion, he does an osteotomy of the shaft in the lower third, and puts the limb up in plaster, with the lower portion externally rotated. When the union is complete he reduces the dislocation of the hip.

[Ed. Note.—The Editors believe that the anteversion does not often offer an actual obstruction to complete reduction, and although if this anteversion persisted it would make the reposition less stable, it has been their experience that with complete reduction and careful after-treatment in many instances it corrects itself.]

Club-Foot.

Cook[28] reports about twenty cases with good results from the removal of the bony wedge from the outer side of the foot. A sufficiently large wedge of bone must be removed, and it is also necessary thoroughly to rotate the front part of the foot to overcome the deformity. Cook keeps the foot in plaster for eight weeks and then uses a foot plate. He considers that the two cases in which a further relapse occurred were due to the insufficient amount of bone removed. He considers the operation is analogous to the work of a carpenter or cabinet maker.

[Ed. Note.—In adults this operation may often be necessary, but in children we doubt the wisdom of removing large wedges of bone. The results are likely to be bad several years later on account of the constant pull of the adducting muscles and the disturbance in growth. One must be careful not to over-correct, because to make a valgus foot out of a varus is making an equally bad deformity. In adults who wish quick results the operation may be done with much satisfaction.]

FRACTURES AND DISLOCATIONS.

Old Patella Fracture.

Phemister[29] has made an interesting study of the problem which is presented in old fractures of the patella, where the resulting separation of the fragments is very great. It is difficult to get fractured surfaces together, and in some cases the intervening space must be bridged over in order to get a functional hold that may be used by the quadriceps muscle. A fascia transplant taken either from the outer side of the thigh or a pedunculated flap from the thinner portion just above the quadriceps tendon may be used for this purpose. The author recommends occasionally removing the insertion of the tendon from the tubercle of the tibia, but it is not generally advisable on account of the difficulty of securing an attachment higher up. Of course, all adhesions about the joint beneath the patella should be freed.

Delayed Union.

Henderson[30] has collected 181 cases of fracture of the long bones treated in the Mayo Clinic during the last four years. Sixty-one of these cases were treated for non-union. The operation to obtain union by the use of bone transplants was performed 31 times. This was found to give success in the large majority of cases, although the procedure was not infallible. It is, of course, of special importance that asepsis should be maintained, that an autogenous graft be used, and that it be carefully placed in assured contact with the fractured bones. The inlay method, as developed by Buchanan and Albee, is found much better than the medullary peg. This latter method does not give as firm support, and leaves in the centre of the bone a foreign body to be absorbed. Of the 31 cases, 16 occurred in the tibia. They were of average duration of 12 months, and seven of them had been previously plated. With a circular saw a piece of bone was removed from the flat internal surfaces of the bone and slid into apposition with the other fragments. In all but one of these cases the result was successful. There were seven cases of non-union of the humerus, and the three of these which afterwards were kept fixed in plaster casts showed good results. The cases which showed non-union he explains as follows: in the tibia on account of the use of a poor bone graft; in the humerus on account of lack of fixation; and in the femur on account of an insufficient size of the bone peg for fixation.

Early Knee Motion in Fracture of Femur.

Ansinn[31] has been impressed with the frequency with which stiff knees and atrophied muscles follow prolonged immobilization in fractures of the femur. He has devised an apparatus which allows early motion of the knee joint, and in 30 cases has been delighted with the results obtained. There was no trace of ankylosis of the knee joint, there was an almost entire absence of atrophy, and firm bony union was obtained in an unusually short time.

[Ed. Note.—The Editors believe attention should be called to this unfortunate and unnecessary sequela of prolonged immobilization in fractures of the femur. The old dictum that prolonged immobilization never stiffens a normal joint would seem not to be sound, unless we conceive the fracture of the shaft of the femur to produce joint changes. Restricted and painful motion in the knee delays very materially return of function in the limb, though union of the fracture may be firm enough to allow the guarded weight-bearing which favors complete solidification. Scudder's simple iron joints, incorporated in plaster at the knee and capable of being set at any angle, accomplish this same purpose well and prevent any lateral or rotary motion of the lower leg which would be likely to disturb femoral alignment.]

Leverage in Reducing Dislocation.

Cochez[32] has found a crutch with a long cross bar lever attached at its lower end, very useful in reducing recent and old dislocations of the shoulder, elbow, hip joint, and knee. The large amount of force, always under complete control, may be registered by a dynamometer, and as much as 170 pounds can be thus exerted without jar or shock. The necessity for counter traction is thus avoided.

[Ed. Note.—In the groin we should suppose considerable pressure might be fairly safely exerted, with no more dangerous result to be expected than skin rupture, but in the axilla care must surely be taken lest injury to the axillary vessels and nerves be produced.]

Habitual Dislocation of the Shoulder.

Selig[33] discusses the various methods which have been used in the treatment of habitual dislocation of the shoulder, and emphasizes the importance of the supraspinatus muscle, which immobilizes the humero-scapular joint and is most important for the function of the joint. Duchenne in 1885 first demonstrated that the supraspinatus was an elevator of the arm, and that, furthermore, its action is necessary in order to keep the head of the humerus in contact with the joint cavity while the arm is elevated. Selig believes that the habitual dislocation is mainly due to elongation of the tendon of the supraspinatus, and has worked out an operation (on the cadaver only) designed to give this muscle its normal power, and consisting in shortening the muscle.

Dislocation of Knee.

Ransohoff[34] reports a case of anterior and external dislocation of the knee (with rotation to an angle of 90°), due to a fall of 48 feet. There was some interference with the circulation in the leg, although pulsation could be felt in both the dorsalis pedis and the posterior tibial arteries. The dislocation was easily reduced, and function at the end of six weeks was practically restored. Ransohoff says that this is only the third case of dislocation of the knee occurring in a large accident service during a period of twenty-seven years, and that only 250 can be collected from the literature.

POSTURE.

Postural Albuminuria.

Jeanneret[35] remarks that Stirling was the first to call attention to intermittent albuminuria in children in connection with the position of the body, and he styled it "postural albuminuria." Jeanneret declares that this is the best name for it, as neither the orthostatic nor the lordotic attitude ever induce it execept in the predisposed. The extreme lordosis, which is induced by Rollier's pillow in heliotherapy of Pott's disease, is borne by children at Leysin over long periods without their developing albuminuria. Jeanneret has also examined other cases of extreme lordosis, and no albuminuria was observed in them at any time. In still further tests, he had all children at the Children's Hospital at Basel lie on Rollier pillows, but albuminuria was scarcely ever observed from the extreme lordosis thus induced. This was the more remarkable as the children in the hospital were all more or less debilitated. On the other hand, 20% of the children in school present intermittent albuminuria. Numerous tests were made in different cases. One child of eleven had no albumin, in bed with milk diet, none in bed on mixed diet, none after three hours of extreme lordosis induced with Rollier cushion, none playing in the garden, and none during one-half hour in the erect posture while she stepped from leg to leg or otherwise exercised the legs. Albumin, however, appeared in the urine in three minutes after the child stood erect in extreme lordosis and kept perfectly still. There was 1% the third minute, 2% the fifth minute, 3% the fifteenth, and 10% the thirtieth minute. Further tests confirmed the importance in the genesis of intermittent albuminuria of this factor, namely, keeping still with the body upright, when this factor was superposed on even moderate lordosis. Of 204 children examined, albuminuria could be induced by lordosis alone in only 3%, and by a change from the seated to the erect posture (orthostatism) only in 1/3%. Both together, the children not keeping still, induced albuminuria in only 1.6%. But the combination of lordosis, orthostatism, and muscular immobility induced more or less albuminuria in 49%. The findings in the various groups are listed in detail in twelve tables. They show that the restlessness of children responds to a physiologic demand, and that children should not be expected to sit still in school. The school desk should be arranged to avoid inducing lordosis. Jeanneret explains the anatomic and physiologic conditions, with illustrations, which are likely to start the albuminuria, when in children the normal play of muscles and the local circulation are checked by keeping motionless.

Orthostatic Albuminuria in Relation to Nephritis.

Holst[36] examined post-mortem the kidneys of a youth of 16 who had had typical orthostatic albuminuria during the last five or six years, but who had been otherwise in normal health until he contracted "galloping tuberculosis" of the lungs. Not a trace of inflammation could be discovered in the kidneys. He reports also ten clinical cases in which orthostatic albuminuria was a chronic condition, but in which no tubular casts were ever found.

WAR SURGERY.

Gunshot Wounds of Knee Joint.

Berard and Barjaval[37] believe that expectant treatment in gunshot wounds of the knee joint is justified, provided the case is followed with constant attention by the same surgeon. The function of many joints may be thus conserved, and they have been impressed with the tolerance of the synovia to the presence of bullets or shell fragments. In four cases the projectile was well tolerated for over two weeks.

Lockwood,[38] on the other hand, though strongly urging conservatism in treatment of compound joint injuries, believes that: (1) All foreign bodies, whether metal or loose bone, should be removed from the knee joint at the earliest possible moment. 2. Perfect immobilization is absolutely necessary. Do not start passive movements too early, that is, not until two weeks after the inflammation has disappeared. 3. All necrotic and edematous tissue should be excised. 4. Capsule closed as soon as possible. 5. No antiseptics other than 2% formaldehyd to be introduced into the joint. 6. No drainage tubes against joint surfaces. Out of 60 cases 49 resulted in free motion, 3 in ankylosis, and the others in limited motion.

[Ed. Note.—These results are surely unusually good, and seem to show very definitely that the conservatism and detailed observation in compound joint injuries, which the Editors strongly recommended in a previous Report of Progress in Orthopaedic Surgery, is not only justified, but demanded.]

Bridge Plasters in Treatment of Compound Fractures.

It is interesting to see the increasing use of plaster-of-Paris casts in the treatment of the severe septic compound fractures, both as a temporary dressing, which gives the soldiers great comfort while they are recovering from shock, as recommended by Sénéchal,[39] and as permanent and even ambulatory dressings, as advised by Aubert[40] and Lance.[41] Aubert has found them as useful in lesions of the upper limbs, even those including the shoulder, as in the lower limbs, and Lance, by including iron bridges, has left the leg accessible from just above the ankle to above the trochanter, using the pelvis and lower thorax as the upper fixed point.

[Ed. Note.—The adoption by some of the best French surgeons of this method speaks strongly in its favor, for our impression is that early in the war there was a more or less general prejudice in France against plaster of Paris in the treatment of these recent and suppurating compound fractures.]

Artificial Limbs.

Much careful work is being done at present on the problem of providing inexpensive and efficient artificial limbs or protheses. The most interesting and valuable articles on the subject which we have seen are those of Dollinger,[42] Brekenfeld,[43] and Natzler.[44]

In order to meet the enormous needs for protheses or artificial limbs, Dollinger, in his clinic at Budapest, has established a workshop in which he employs wounded soldiers as inmates. He started the workshop in March, 1915., with one man, and employs now [October, 1915, when the article was written,] 108. During these six or seven months more than 1000 artificial limbs and several hundred other orthopaedic apparatus have been made. He emphasizes the fact that patients with amputated legs learn to walk very quickly with their artificial limbs, provided they fit well. If they have been in bed for a long time it takes longer to learn to walk because of the weakness of the muscles, but even among these he has seen several with amputation of both thighs, learn to walk comparatively quickly with the artificial limbs. Dollinger goes into many of the details of his work, and his descriptions are well illustrated.

1. Prothesis of lower leg. If it can be avoided it is better not to suspend the prothesis by a pelvic belt, nor should it be held on the femur by anything constricting. The prothesis is made over a plaster model, which is very carefully moulded over the condyles of the femur and tibia. Over this cast a steel plate is made, which is fastened to a leather cuff which is to reach up to the middle of the thigh. The weight-bearing is borne by the condyles of the femur and by the inner condyle of the tibia. The patient does not walk on his stump directly. A plaster cast of the good leg is made for comparison to determine the desirable length, etc.

2. Prothesis for amputated thigh. In very fat patients, Dollinger uses for suspension the customary shoulder belt. In others, however, he suspends it on a girdle, which is carefully modeled over the pelvis, and which reaches about 3-4 fingers' width above the pelvis on the back.

Weight-bearing is, as a rule, not possible or advisable on the stump itself, therefore a kind of seat is constructed over a carefully-made model, in which the patient, as it were, sits on his ischial tuberosity. The model is taken while the subject stands upon the good leg, with slight head extension. A cast is made of nearly the whole trunk, the stump, and the good leg. 3. *Protheses for amputated hands and forearms* are modeled in a way similar to those for the lower leg, that is, over the distal end of the bones of the forearm and the condyles of the humerus.

Brekenfeld[43] describes artificial limbs used by Hoeftmann in Königsberg. After a great deal of experimenting, Hoeftmann has come to the conclusion that a solid foot piece, which, however, is not as long as the normal foot, is best. The jointed feet, as well as those constructed with a rubber pad, do not allow enough stability and safety, especially in going up and down stairs, and the patient loses confidence in his limb. The details of the construction must be seen from the original. During the present war the artificial limbs of Hoeftmann have stood the test in a most excellent manner. The author describes the case of a captain in the army whose femur was amputated, and who is now doing full field duty with an artificial leg made in the workshop of Hoeftmann's clinic.

Natzler,[44] who is an assistant of Riedinger in Würzburg, emphasizes the importance of making for substitutions of lost arms or parts of the arm, not artificial limbs which resemble the shape of the normal arm, but of making what he calls "workmen's protheses." It is important not to make these protheses for the arm too long, but a good deal shorter than the normal arm measurements. The illustrated descriptions of patients who do full duty as mechanics, show how useful these simple apparatus can be,—indeed, much more useful than more elaborate artificial arms and hands.

Wounds of Peripheral Nerves.

Stoffel[45] believes that the neurolysis (*i.e.* freeing nerves from adhesions, etc.) which is frequently indicated in wounded soldiers, should be undertaken only with a full consideration of the anatomical structure of the nerves. He advises repairing first the motor tracts, and only after these have been sufficiently repaired, the sensory tracts may be considered if it seems wise. The use of a sterilized magnifying glass is very useful. The improvement after neurolysis is sometimes very surprisingly fast. Stoffel has seen cases which showed the first traces of improvement a few days after the operation, though in the majority of cases it takes several months before function is restored. At all events, one should not excise the nerve in its whole continuity before one has studied the nerve tracts.

Stracker[46] reports about 225 operations on wounded peripheral nerves which have been done between February, 1915, and January, 1916, in Spitzy's hospital. The operations have been performed by Spitzy, Erlacher, and the author. Of the 225 cases, 93 were resections; in 39 neurolysis was performed, in 15 a tuberlization, and in 4 a grafting. It is of interest to note the great difference in the result after resections in the various nerves. Among 25 cases of resection of the radial nerve, 12 showed recovery of the motility; of 13 cases of the median, 4 recovered; of 13 cases of the ulnar, 3 recovered; of 12 cases of the sciatic nerve, 2 recovered; and of 21 cases of the peroneal nerve, 1 recovered. The results after neurolysis were much better. In some cases a distinct improvement was seen from a few hours up to a few days after the neurolysis.

MISCELLANEOUS ARTICLES.

Preventive Orthopaedic Surgery.

Hardouin[47] has encountered a number of cases in which, after a bullet passed through the calf, the disturbances were so slight that the men were soon on their feet. The traction on the wound, however, caused pain, and in order to prevent this the foot was held in an abnormal position of actual talipes equinus, and as these men were known to be mildly wounded, they did not get the medical supervision of the other wounded. But the deformed attitude of the foot soon became permanent, and they were left cripples unless the deformity was noticed and corrected in time. If they were allowed to use crutches, permanent crippling was almost inevitable. Men with wounds in the legs should not be allowed to be on their feet until the wound is entirely healed. Disregard of this principle makes the healing drag for weeks longer than it should. When they are allowed to walk, the position of the foot should be kept normal, and it should be exercised only a very little at first. Massage is seldom useful, but a plaster cast may be needed in the grave cases.

[Ed. Note.—This observation of Hardouin's is entirely correct and represents one of the great advantages of preventive orthopædic surgery. The value and economy of this type of anticipatory treatment, based on a knowledge of the sequelae of neglect, can hardly be overemphasized, and the emphasis should be placed by orthopaedic surgeons.]

Persistent Sciatica Relieved by Förster's Operation.

Metraux[48] reports the case of a man of 30, who had suffered more or less from a left sciatica for five years, and whose pain for the last six months had become agonizing, totally incapacitating the patient, and rebellious to all measures, including treatment for syphilis. As a last resort, Förster's operation was proposed, and in October, 1914, through an incision from the second lumbar to the first sacral spinous process, from 1.5 to 2.5 cm. of the second sacral posterior root and the fifth lumbar were resected. Tamini, of Buenos Aires, has demonstrated that the last large root of the cauda equina is the second sacral root, and that this second sacral root is only half the size of the first sacral, whose diameter is the same as that of the last lumbar roots. The second sacral was thus easily located, and not more than 25 c.c. of spinal fluid was lost during the operation. The patient was kept lying prone for 24 hours, and the stitches were removed on the eighth day. There was then pronounced paresis of the left leg, but no single group of muscles seemed paralyzed, and motor functioning was gradually regained. Two months afterward the patient could take long walks without fatigue, and there has been no return of the pain, and the sciatic is not tender. The patient is said to be "enchanted with the result." Along the back of the thigh and the inner margin of the foot the sensibility is reduced, and there is an occasional burning sensation in the sole of the foot.

Multiple Cartilaginous Exostoses.

Ashhurst[49] has contributed an interesting paper on multiple cartilaginous exostoses. Cases showing numerous exostoses were described by Ollier in 1899, and mention was also made of them by Hawkins in 1837. Ehrenfried has recently collected 12 cases. The author reports 11 cases. He does not think that the exostoses are an essential feature; the irregular epiphyseal line is the more important characteristic. The epiphyses are small, misshapen, and the shafts of the bones curved. There are nests of uncalcified cells just beneath the periosteum near the ends of the shaft, which later develop into irregular growths which are almost always benign. They usually develop at an age of 12-16 years, and occasionally a second crop appears in later life. Certain of Ashhurst's cases showed definite exostoses developing without cause. Many, however, had a definite trauma, often slight, but still with a local lesion. While Ehrenfried believes the etiology is due to some embryological factor, as a faulty "anlage" for the development of bone, the author considers that these cases represent a certain type of chondrodystrophy, and that the exostoses are generally determined by other factors.

Juxta-articular Sarcoma.

Roberts[50] states that it is often the case that this type of tumor located in the vertebra or near the hip or knee gives symptoms which resemble pictures of tuberculosis. A careful study of the nerve symptoms and the influence of weight-bearing may differentiate these. Roberts considers the x-ray the most important means of diagnosis. The local pain and local tenderness and the deformity, which does not always correspond to the x-ray picture, are important elements in determining the nature of the disease. Treatment by fixation often does not relieve the pain, and the absence of bony atrophy and abscesses are further points in differentiating it from tuberculosis.

Pathology of Trench Frostbite.

Smith, Ritchie, and Dawson[51] have conducted a very practical research into the experimental and clinical pathology of this condition. The exposure of the feet insufficiently clad is undoubtedly the cause of much of all foot troubles and adds to the discomfort of many patients with strained and pronated feet. This is a study of 51 clinical cases of soldiers returning from the front. They had been in the cold, muddy trenches, often in water up to the waist, and suffered from exposure to the rain, sleet and snow; conditions that are sometimes reproduced in the occupations of our laboring class. Most of the cases showed marked swelling, tenderness, sometimes local heat, and considerable disability. It was felt that the part played by tight boots and leggings had much to do with preventing proper circulation. Experiments made with rabbits showed very interesting changes, which offer some explanation of the course of the disease. The essential change in the feet when exposed to the severe cold consists in damage to the blood vessels. After an initial constriction of the vessels passes off, swelling of the feet occurs, while the circulation is being restored to its normal. Microscopically, there is shown a swelling of the lining endothelial cells of the vessels and destruction in the muscle fibres of the walls. Excessive fluid is poured out into the tissues, even though the walls of the vessels may not be ruptured. The resulting stasis interferes with the vitality of the cells in the surrounding connective tissue. Leucocytes and other phagocytic cells appear in the tissue, and a general chronic inflammatory process may take place. The nature of these changes clearly explains the slowness of the recovery. For this to be complete, there must be not only an absorption of the swelling, but a restoration of the vessel walls so that they can stand the strain of the changes in the circulation which take place when the patients begin to walk again; thus it is found that often when the swelling has disappeared, pain, tenderness, and disturbance of function still persist, and any application of extreme cold or heat is apt to bring back the symptoms. Experimentally, they also show the part that is played by pressure and constriction in predisposing the parts to the effects of cold. Very little has been written on the treatment of this condition, but Dr. W. J. Terrell, in the *Practitioner* for January, 1916, speaks of the value of electrical treatment and the use of high frequency in stimulating the circulation in some of these cases.

Spontaneous Gangrene.

McArthur[52] discusses the treatment of a spontaneous gangrene, termed "thrombo-angiitis'' by Buerger, and ''spontaneous gangrene of the young,'' by Koga. The condition in this country is almost exclusively found among members of the Jewish race. Mayesima had determined the constant high viscoscity of the blood in all cases of gangrene, and acting on this, Koga confirmed Mayesima's findings and reduced the viscosity by diluting the blood with physiologic solutions (Ringer's). Cases which in the past would undoubtedly have been condemned to high amputation, he succeeded in curing by the simple expedient of hypodermoclysis of a sufficient quantity of Ringer's solution and over a sufficient period of time to reduce the viscosity of the patient's blood. McArthur says that the testimony of all those who have faithfully carried out Koga's recommendation verifies his claims.

Syphilis of the Spine.

Whitney and Baldwin,[53] in a study of 100 unselected cases of syphilis, found 36 patients with sharply localized stiffness of a segment of the spine, the remaining portions of the spine being flexible. In these, 18 showed hypotonicity. (By this term the authors apparently mean a lack of muscular tone and a laxness of the articulations, allowing freer motion than normal, chiefly in the lumbo-sacral region.) Among 25 patients with localized stiffness and less marked general stiffness, 11 showed hypotonicity. Among 7 patients with uniformly stiff spines, 2 showed hypotonicity. They conclude: (1) That a localized stiffness of the spine is strongly suggestive of syphilis. This was present in over half of this series, and rare in nonsyphilitic cases. (2) That localized stiffness of the spine with hypotonicity of the uninvolved spine and the pelvis and hip joints, is almost pathognomonic of syphilis. (3) That a negative Wassermann reaction should not be interpreted as excluding syphilis in the presence of other signs which suggest joint syphilis.

ORTHOPAEDIC PREPAREDNESS.

At the annual meeting of the American Orthopedic Association, held in Washington in conjunction with the American College of Physicians and Surgeons, the matter of orthopaedic preparedness was brought up for discussion at one of the executive sessions. It was pointed out that perhaps no specialty in medicine had a possibility of being of more far-reaching usefulness than orthopaedic surgery. Judgment as to the efficiency of the locomotive apparatus of recruits, the prevention of deformity, the problems of immobilization of acute bone and joint injuries, the restoration of function, apparatus for the maimed, the organization of cripple industries, are all matters of peculiar orthopaedic concern. The present war has demonstrated these facts and also unfortunately shown how lacking in preparation along these lines most of the European governments found themselves at the opening of hostilities. It is most desirable that in America, where orthopaedic surgery is well developed, some form of organization of the orthopaedic resources should at once be undertaken. A committee was appointed, of which Dr. Joel E. Goldthwait was made chairman, to consider methods and means. This matter was also brought to the attention of the Orthopaedic Section of the American Medical Association and a committee with similar aims was appointed, and in order that the two committees might work conjointly, Dr. Goldthwait was appointed chairman of this committee also. The attitude of the United States Government was next ascertained, and a most cordial approval of the plan and a promise of help was received. It seems to the Editors that this committee has an unusual opportunity for usefulness and a great responsibility. Already plans for an orthopaedic base hospital have been outlined, its necessary equipment studied, and the available personnel ascertained. This surely represents progress in orthopaedic surgery and in general medical preparedness.

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Book Reviews.

A Handbook of Infant Feeding. By Lawrence T. Royster, M.D., Attending Physician, Bonney Home for Girls and Foundling Ward of the Norfolk Society for the Prevention of Cruelty to Children: Physician-in-Charge of King's Daughters' Visiting Nurse Clinic for Sick Babies. Illustrated. St. Louis: C. V. Mosby Company. 1916.

The author states in his preface that the object of this little book is to furnish the essentials, and only the essentials, of infant feeding in a compact and succinct form for the use of the family physician and general practitioner. He follows, in general, the teachings of the Harvard Medical School, advocates the calculation of food mixtures in percentages of the various food elements, recognizes the part which bacteria play in the causation of diseases of the digestive tract in infancy, and emphasizes the value of the examination of the stools as a guide to diagnosis and treatment. His point of view is always sane and reasonable and his explanations clear and simple. This book should, therefore, be of great assistance to those for whom it is written, namely, the general practitioner and family physician.

Urgent Surgery. By Félix Lejars. Translated from the Seventh French Edition by William S. Dickie, F.R.C.S., and Ernest Ward, M.A., M.D., F.R.C.S. (Third English Impression.) With 20 full-page plates and 1086 illustrations, of which 729 are drawn by Dr. E. Daliene and A. Leuba, and 198 are from original photographs. Vol II. The Genito-Urinary Organs; The Rectum and Anus; The Strangulated Hernias; The Extremities. New York: William Wood and Company. 1915.

The second of Lejars' two volumes is a book of some 600 pages and, like its companion, is excellently printed, and profusely and effectively illustrated.

The work strikes the reviewer forcibly as a treatise on Operative Surgery, thinly disguised by the word "Urgent." Certainly, almost every operative method is considered, and usually adequately described, including such measures as perineorrhaphy, hematocolpos, operations for simple fracture of the patella and other simple fractures, wounds of nerves, etc. It is somewhat paradoxical that the work should not have been a little more complete, and described by a less restricting title.

The work strongly reflects the opinion and habits of the writer. Citations and quotations are few, very few indeed, from America. It is somewhat of a shock to read in the chapter on Dislocation of the Hip, "This method, which was originally employed by Desprès père and afterwards systematized by Bigelow," and to discover that no mention is made of the inverted Y-ligament, either in print or in picture.

The descriptions are brief and accurate; the practice and operative methods at times seem strange to Americans.

The book is an admirable presentation of French views in operative surgery, very suggestive, and valuable as a reference.

The Principles and Practice of Perimetry. By Luther C. Peter, A.M., M.D., F.A.C.S. Illustrated. Philadelphia: Lea and Febiger. 1916.

This book ought to receive a warm welcome from ophthalmologists. As far as we know, there is no single volume in English on Perimetry. There is room for one, and Dr. Peter's work has admirably supplied this want. The book is full enough to be worth while without being tiresome. It is a systematic study of perimetry, its principles and practice. Various devices for taking fields are described, but the author devotes most of this part of his work to practical office methods, and many of us can learn something here. Anatomy, physiology and general pathology of the visual field are given space enough, while the second half of the volume treats of special pathology of fields. The field in functional nervous diseases is the subject of the last chapter. A bibliography, mostly confined to the last decade, is given and an excellent index.

The Nose, Throat and Ear, their Functions and Diseases. A Treatise upon the Breath-Road, Food-Road and Accessory Organs. By Ben Clark Gile, M.D., Instructor in Otology in the University of Pennsylvania. With 131 illustrations. Philadelphia: P. Blakiston's Son & Co. 1915.

This is a book of 450 pages intended to give the more important facts of etiology, pathology and treatment of diseases of the nose, throat and ear. Many of these facts are well stated, but this is not always the case. For instance, in the brief chapter on laryngeal neuroses, the following assertions appear, "The nerves of the larynx are the superior laryngeal whose function is motor, and the inferior, or recurrent laryngeal which conveys motor and also sensory impulses." "The arytenoid and cricoarytenoid muscles are the adductors of the vocal cords." The modern theory that vaso-motor rhinitis is an anaphylactic reaction to certain proteins is entirely ignored. Ready reference is much impaired by the lack of sub-divisions, making it necessary to refer constantly to the index. The book is brightened by an occasional discursive exposition of frailties of human nature, both lay and medical. It contains much good sense, and is an attractive manual more descriptive than didactive in its composition.

The Mortality from Cancer Throughout the World. By F. L. Hoffman. Published by the Prudential Insurance Company of America, 1916.

A readable statistical study is rare. This work is not only very readable, but also the valuable information gathered is set down in an interesting and concise manner.

The author recognizes the difficulties of gathering accurate statistics on a subject so variously termed as cancer, and states that he wishes his work to be considered subject to such necessary errors as one must encounter in such a broad work. The work contains in every chapter a valuable bibliography of the most important books reviewed, and often brief abstracts of these works are given in order to make the text more explicit. The menace of cancer is emphasized and proof brought forward to substantiate the recently expressed view that cancer is not only relatively, but actually, on the increase. The importance of a world-wide educational campaign is emphasized. Several chapters are devoted to such practical topics as the mortality of cancer in different occupations, cancer in its relation to life insurance, statistical studies of cancer in American cities and foreign countries, racial cancer, precancerous states, problems of recurrence, degree of malignancy of certain types and under certain conditions, the question of heredity, relation of cancer to other chronic diseases. All these are treated in an interesting but general way. The work contains about 200 pages of text and 600 devoted to charts and tables. It is a well-compiled, up-to-date and well-presented work, which must have involved great labor and is a worthy and valuable book of reference.

The Endocrine Organs. An Introduction to the Study of Internal Secretion. By Sir Edward A. Schafer, LL. D., D.Sc., M.D., F.R.S. Professor of Physiology in Edinburgh University. London and New York: Longmans, Green and Company.

In the summer of 1913 Professor Schafer delivered the Lane Medical Lectures at Stanford University. He took for his topic the organs of internal secretion. The lectures were published by the University, but in abbreviated form and without illustration, so the author has reissued them in the present volume.

The work consists almost wholly of descriptions of experimental and clinical observations. Conclusions are drawn cautiously or not at all, as is eminently proper in a field in which, on account of the rapid accumulation of data, conclusions are necessarily wholly provisional. The numerous excellent plates add greatly to the value of the book, as they do to its cost.

The Involuntary Nervous System. By Walter Holbrook Gaskell, M.A., M.D., F.R.S. London and New York: Longmans, Green and Company.

To the serious student no form of presentation of any special subject is more satisfactory than an authoritative monograph. The publishers of the work here under review have made a feature of series of such monographs in various fields of science, and in so doing have conferred a great benefit upon students everywhere.

This work of Professor Gaskell's, prepared during the closing years of his life and published posthumously, is an epitome of a course of lectures on the sympathetic and allied nervous systems, given by the author year after year. It represents in very large measure his own contribution, since he took a prominent part in the development of our present conceptions concerning these portions of the nervous system, particularly in their earlier stages. Professor Gaskell was specially interested in the phylogenetic significance of physiology, and much of the value of this work lies in the discussions of the bearing of the facts presented on the principles of evolution. It is unfortunate that Professor Gaskell did not live to see the remarkable clarification of our views concerning the sympathetic system, that has resulted from the researches of Cannon and his students. No one would have appreciated more than he the significance of Cannon's correlation of the entire sympathetic system into an integer.

A valuable feature of the book is the bibliography, which covers 13 pages and includes all the important titles up to 1914.

Blood Pressure. Its Clinical Applications. By George William Norris, A.B., M.D. Second edition, revised and enlarged. Philadelphia and New York: Lea and Febiger. 1916.

The first edition of this clinical text-book on blood pressure was reviewed in the issue of the Journal for November 12, 1914 (Vol. clxxi, p. 755). This second edition is increased in size by the addition of new material from the constantly growing literature on this important subject; but the author has continued his endeavor to present this material in condensed and practical form. Whenever possible, a summary of experimental as well as of clinical data is included. In addition to the chapters on physiology and on venous blood pressure by Dr. J. Harold Austin there is appended a chapter on functional efficiency of the circulation, in the preparation of which Dr. Austin's assistance is also acknowledged. The number of engravings with which this edition is illustrated is increased to 102. It should continue to maintain its position of value as a presentation of the literary history of the subject and as a correlation of experimental data with clinical experience.

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PROGRESS OF THE POLIOMYELITIS EPIDEMICS.

During the past week the various epidemics of poliomyelitis in the United States, though still active, have seemed to show a definite tendency to decrease. In New York City, on August 30, the number of cases reached a total of 7,986, with 1,911 deaths. In New York State, outside the city, the total of cases on that date was 1,620, with 166 deaths.

The second largest focus of the disease is in New Jersey, where the total number of cases has been 2,163, with 205 deaths. The other principal epidemics are in Pennsylvania, Connecticut, Massachusetts and Rhode Island. In Chicago there have been 85 cases; in Connecticut, 352. The northern New England states have been practically immune from the disease, there having been 14 cases in Maine, only 3 in New Hampshire, and none in Vermont.

The Massachusetts epidemic as yet has not attained the proportions of the two serious epidemics of 1909 and 1910. The number of cases of poliomyelitis in this state during the past eight years has been as follows: 136 in 1908, 923 in 1909, 845 in 1910, 232 in 1911, 169 in 1912, 361 in 1913, 151 in 1914, and 135 in 1915. The total of cases in Massachusetts in August, 1916, is 248, of which 221 have been in North Adams.

In the issue of the Journal for August 24, we noted editorially the national conference of state and territorial officials which was held on August 17, in Washington, D. C., under the auspices of the United States Public Health Service, to standardize methods of combating poliomyelitis throughout the country. Representatives of 38 states were present at this conference, whose decisions related chiefly to the establishment of uniform interstate quarantine and travel restriction. It was decided that every child under 16 must have a certificate of travel without which it must not enter or leave the state of its residence. Any children entering another state without such a certificate are to be placed under quarantine. This certificate of travel is to state the name of the place from which the child is traveling, its intended destination, and the local prevalence of poliomyelitis. This certificate is not a guarantee of immunity, nor does it exempt its possessor from examination by a physician and observation for a fortnight in the place to which the child goes. It is hoped that the adoption of these provisions through the greater part of the United States will result in checking further extension of the disease and the establishment of new foci.

Following the Washington conference, a further conference of New England health officials was held in Boston, at which representatives were present from Maine, New Hampshire, Massachusetts and Rhode Island. These representatives were Dr. A. G. Young, Secretary Maine State Board of Health, Dr. Allan J. McLaughlin, and Dr. Eugene R. Kelley of the Massachusetts Health Department, Dr. Gardner T. Schwartz, Secretary of the Rhode Island State Board of Health, and Dr. Francis X. Mahoney and Dr. T. B. Shea of the Boston Health Department. This conference voted to permit, in New England, free passage of persons from any state through another, provided these persons come from uninfected houses or premises. Perhaps the only amusing feature in this present serious visitation has been the setting up at Chinatown, in Boston, of a large dragon whose presence, the residents believe, will avert the local incidence of poliomyelitis.

In the issue of the *Journal of the American Medical Association* for August 19, is published an important note by Dr. Simon Flexner on the serum treatment of poliomyelitis, to which reference has been made in recent editorials in the JOURNAL. Dr. Flexner summarizes the history of the serological study of poliomyelitis and the steps previously taken in the experimental serum therapy of the disease. Finally, he cites the work of Netter and Salanier, published in the *Bulletin of the Academy of Medicine,* for October 12, 1915, and the *Bulletin of the Medical Society of the Hospitals of Paris,* for March 10, 1916. In reviewing Netter's work Dr. Flexner says:

> "Netter was the first to apply the data obtained by experiments on monkeys to the treatment of cases of epidemic poliomyelitis in men. He had published the results obtained in a small series of 35 cases which he regarded as highly favorable to the method.
>
> "He employed the serum from cases of poliomyelitis in which complete recovery from the acute condition had taken place some time—even as long as 30 years—previously. The serum injections were given subdurally as soon after the appearance and recognition of the symptoms of poliomyelitis as possible."

The serum is, of course, sterile, and need not be inactivated. Its dosage is determined by the age of the patient and by the quantity of the serum available. Initial doses of from 5 to 20 c.c. may be employed and repeated several times at daily intervals, according to clinical conditions and indications. The effects of the immune serum are to be sought in checking the progress of the disease, that is, in the prevention or minimization of the paralysis when given in the preparalytic stage and in the arrest of its extension when given in progressive paralytic conditions.

> "Since the immunity substances have been determined by neutralization tests to persist in the blood for many years, it is probable, as Netter has indicated, that persons who have passed through an attack of poliomyelitis many years earlier, may be utilized as sources of the serum. Reasoning from analogy it would probably be advantageous to prefer persons whose attacks were less remote so as to insure as high concentration of the immunity bodies as possible.
>
> "In choosing the person who is to serve as the source of the blood from which the immune serum is to be derived care should, of course, be taken to secure a healthy donor."

Dr. Flexner's authority in poliomyelitis is unique and with his endorsement following upon the successful results reported by Netter and Salanier it may be expected that serum therapy now offers the best, and perhaps a completely controlling, therapeutic measure in poliomyelitis.

THE MEDICAL KNOWLEDGE OF CERVANTES.

IN last week's issue of the JOURNAL, we commented editorially on certain medical aspects of Shakespeare's genius, and briefly reviewed some of the recent literature bearing upon this subject. It should not be forgotten that this year is equally the tercentenary of the death of Miguel de Cervantes, to whose creative power we owe, in Don Quixote, a character almost the equal of Falstaff, and whose interest in medicine is reflected in many passages of his great work.

Doubtless in his case this interest was partly hereditary, for Rodrigo de Cervantes, his father, was a surgeon apothecary. Miguel himself, born in 1547, entered the Spanish navy, then the most powerful in the world and offering to young men an attractive career of adventure. It is narrated of him that at the Battle of Lepanto he lay ill of a fever aboard his ship, the *Marquesa,* but insisted on going above to fight. He received two gunshot wounds in the chest, and a third which permanently disabled his right hand. Perhaps his personal surgical experience at this time, and later as a Moorish captive, further increased his knowledge of the medical profession, upon which many Spanish authors have written.

In the issue of the *British Medical Journal* for May 20, 1916, was published the following editorial comment on the medical knowledge of Cervantes as evidenced in various of his works:—

> "Cervantes mentions about a hundred plants, describing their medicinal and alimentary uses, and he is acquainted with the great compilation of Dioscorides on materia medica, at least in the Spanish translation of Andrés Laguna of Segovia, physician to Charles I (afterwards the Emperor Charles V) and Philip II. He had also read Pliny's *Natural History,* then held in Spain, as it was in England at that day, as of high authority on all things medical. He speaks of poisons which breed madness in men's brains, and discharges shafts of satire at druggists and doctors, but it is only pretenders and impostors at whom they are aimed.
>
> "In more than one passage Cervantes scoffs at secret and superstitious remedies. When Don Quixote is losing blood after a fight, he re-

grets that he has not by him the Balsam of Fierabras, a medicine of such potency that if his body were cloven in twain, one part could be accurately adjusted to the other 'before the blood congeal,' when two draughts would make him 'sounder than an apple.' This balsam was believed to be a part of that used by Joseph of Arimathea to embalm the body of Christ. Elsewhere Sancho prepares for his bruised master a compound of simples, over which he says a number of Paters, Aves, Salves, and Credos, with many signs of the cross.

"Cervantes makes some unmistakable allusions to venereal disease. In *El Casamiento Engañoso* there is a description of an unfortunate officer leaving hospital where he had sweated away fourteen loads of buboes. In the same work mention is made of a disease called *lupicia* (alopecia) or *pelareta* (from *pelar*, to pluck out hair), treated by sweating, which makes all the hair, including the eyebrows, eyelashes, and beard fall out. The scene of the Coloquio de los Perros in the *Novelas Ejemplares* is laid in the Hospital of the Resurrection at Valladolid. In many places Cervantes dwells on the hygienic value of plain diet and moderation in eating. Delightful fun is made of the dietetic crank, Dr. Pedro Recio de Agüero, who stands beside Sancho when he is at table and condemns the various dishes set before him—one as being too moist, another too heating, and so forth, till the starving governor of Barataria threatens to knock him on the head with the chair on which he is sitting, saying that if he is charged with murder he will plead in excuse that he has rendered a service to God by killing a bad doctor.

"It was disease of the mind which most interested Cervantes, and Pi y Molist has written a book on him as a medical psychologist. If Cervantes does not bring so many mad folk before us as Shakespeare, he gives in *Don Quixote* the most finished picture in all literature of a certain type of insanity. Much reading of romances of chivalry had made the Knight of the Sorrowful Countenance mad. On all other subjects he was of good understanding and could discourse rationally. Cervantes speaks of hallucinations of smell which make the Don describe as an aromatic fragrance the odor diffused by his Dulcinea. He also refers to the loss of memory which makes the Knight exaggerate his adventures as caused by continual and extraordinary labors. The methods by which those about him seek to divert his mind from the exalted ideas which had led him to go about in search of adventures show that his creator had a clear notion of the value of moral treatment. The last illness of Quixote, in which he passes from madness to profound melancholy and recovers his reason with the onset of fever, may be compared with the death of Lear. Sancho Panza is an example of what Charles Lamb calls the 'twilight state of insanity, the madness at second hand, the contagion caught from a stronger mind infected.' In *El Licenciado Vidriera* Cervantes gives a picture of madness brought on in a student of Salamanca by a love philtre, such as is said to have caused the death of Lucretius. The young man imagined that he was made of glass from head to foot; when any one came near he would call upon him with terrible cries to keep away, lest he should be broken.

"In the 'Colloquy of the Dogs' we get a glimpse of the overcrowding of the medical profession in Cervantes' day. A student of Alcalá is quoted as saying that of the 5,000 students in that university 2,000 belonged to the medical faculty. The comment on this remark is that either all these doctors would require to have sufficient patients to cure—'which would be a terrible disaster'—or they must die of hunger. This makes one think of Abernethy's exclamation, on entering the crowded theatre of St. Bartholomew's on the opening day of a winter session: 'God help you, gentlemen! What is to become of you all?' "

A MATERIALISTIC VIEW OF MENTAL DISORDER.

Mens sana in corpore sano is a sufficiently euphemistic doctrine to be quoted frequently; this in spite of the fact that the exceptions are at least as prevalent as the rule. Those physicians who are attached to institutions for the insane know cases of men of magnificent physique who are imbeciles. These patients live sometimes to a ripe old age and when they finally die, say of Bright's disease or pneumonia, aside from the actual cause of death and some normal senile changes, no pathological changes may be found. On the other hand, how many absolutely healthy men physically do we meet daily? especially if we are thrown in contact with a class engaged in sedentary occupations. Every pathologist will tell you of the frequency of disease discovered only post-mortem. A normal kidney in an adult is a *rara avis* and we all have tuberculosis more or less.

We can sympathize with those investigators who seek for the causes for such mental disorders as dementia precox and the manic-depressive group in physical disturbances, especially when they approach the subject in a scientific spirit and with an open mind; but attempts to correlate anatomical findings and mental symptoms which have little or no apparent connection are less open to sympathy.

The colon as the source of all evil appears again in the columns of the *Lancet* for June 24.

Dr. Rupert Farrant reports results of his investigations on lunatics. His studies were particularly of the endocrinous glands, the colon and the faeces. As is the case in most English contributions to psychiatry, the terms used are the older ones, designating disease groups which have been later separated into component parts or merged into other groups with which they really belong, so that we are not always sure of an agreement even in essentials. Thus Farrant speaks of primary and secondary amentia, acute confusional mania and melancholia. He also shows a tendency to be extremely indefinite in his statements as to what he really found. Thus he says, "In dementia precox an alteration was found in the glands which varied with the duration of the case." He does not say the nature of the alteration,—what glands were involved, how these changes "varied with the duration of the case," what percentage of the cases showed such changes and how these changes compare with the condition found in the same glands in mentally normal individuals. His other statements are similarly general and his deductions therefrom are certainly open to question, especially in view of the data presented.

He states for instance: "Cases of dementia precox exhibit a polyglandular syndrome and different gland types are to be found, and the appearances of the cases vary whether the gland is hypertrophic or atrophic." The only apposite statement which he had made before the generalization is this (besides the one quoted above).

"The pituitary gland was found sometimes to have given rise to symptoms of hyperpituitarism, to apituitarism in idiocy, dementia precox, and other forms of insanity."

Farrant concludes by saying that the treatment now becomes obvious, which it certainly does, providing only that the etiology is correct. He has started to work with a number of cases at the Bethlehem Hospital, beginning with medical and surgical treatment directed to the glands and the colon and, where the former have degenerated, glandular therapy is to be exhibited. We await his results with interest, but with pardonable pessimism. His theories of mental disorder have a familiar ring to them; they savor somewhat of the age when the conception that a physical condition could be due to a psychic cause was unconceivable, although then as now men are quite ready to admit a pyschic effect of a physical cause.

MEDICAL NOTES.

PREVALENCE OF MALARIA PELLAGRA, SMALL-POX AND TYPHOID FEVER.—The weekly report of the U. S. Public Health Service for August 18, states that during the month of July, 1916, there were in Arkansas 700 cases of malaria, 113 of pellagra, 45 of smallpox, and 64 of typhoid fever. During the same period there were in Wisconsin 52 cases of smallpox and 59 of typhoid.

THE BUBONIC PLAGUE AT BRISTOL.—Report from Bristol, England, on August 17, states that 3 cases of bubonic plague have recently occurred in that port.

FUND FOR UNIVERSITY OF PENNSYLVANIA HOSPITAL.—Report from Philadelphia on August 24 states that the University of Pennsylvania Hospital is to receive a fund of over three million dollars bequeathed in 1908 by Anna J. Jeans, for the treatment of cancerous, nervous and disabling disorders.

HEALTH INSURANCE.—Compulsory health insurance for wage-earners, which is now being strongly advocated in this country, is pretty certain to be given advancement by the adoption of the measure as a plank in the platform of the national liberal party of Canada, led by Sir Wilfrid Laurier. Compulsory insurance, with provision for contributions from the state, employers and employees, has already been established in Germany, Austria-Hungary, Russia, Great Britain, Holland, Norway, Rumania and Servia. The new Canadian plan includes maternity benefits. There is considerable expectation that the conservative party will follow the liberal lead and that legislation will follow soon after the war. A model bill for the United States has been drafted by the American association for labor legislation and will be introduced next year, the association announces, in 20 state legislatures.

MIRAMICHI HOSPITAL.—Report from Newcastle, N. B., on August 24, states that the new Miramichi Hospital in that city, founded by Mr. Ernest Hutchinson of Douglastown, was formally opened on July 1.

"It is the largest and most completely equipped hospital in the maritime provinces. The building is of Miramichi sandstone and has a frontage of 144 feet, with an average width, exclusive of verandahs, of forty feet. It is of three stories besides a full-sized basement, eleven feet one inch from floor to ceiling. Its furniture is of the best that could be procured and the sanitary arrangements are perfect. There is a Wappler x-ray machine with all the latest appliances. The sterilizer is a Bramhall Deane. The kitchen, staff's dining room, and x-ray and dark room, emergency room, boiler and fuel rooms, laundry, janitor's apartments, etc., are in the basement. The partitions and ceiling are all fire-proof.

The ground floor contains two public wards, male medical and female medical. These wards are each 24x28 ft. with twelve-foot ceilings, and contain six beds each. On this floor, to the right of the staircase and elevator, are the main office and the board of trustees' office, while to the left are the general waiting room and the nurses' parlor. Just across the hall is the matron's private room. The corridors are the full length of the central part of the building, and are divided from the wards by brick fire walls with self-closing fire doors, thus making three distinct compartments on each floor. In case of fire one may easily be closed from the other.

The second floor contains two public wards exactly like those on the ground floor, but which will be used as male and female surgical. On this floor, also, there are seven private rooms, each fitted with private baths and fireplaces.

All of these rooms have easy access to spacious verandahs, two stories in height, each floor being 16x33 ft., and overlooking the river.

The third floor is the home of the nurses, and contains the operating department. This department has all the latest conveniences and appliances, sterilizing and anesthetic rooms, etc. The operating room and the many bath rooms and toilets are fitted up with petrosilo floors and walls. The doctor's room has a shower bath and steel lockers. There are two fire escapes, one at each end, running from top story to the ground. There is an observatory on the roof."

The Senate Committee on Public Health and National Quarantine has reported favorably the bill to promote the efficiency of the United States Public Health Service. The bill has already passed the House of Representatives. The bill limits, according to the *Journal of the American Medical Association,* the appointment of the surgeon-general of the Public Health Service to commissioned officers in the service, not lower in grade than surgeon, and requires that the surgeon-general, at the expiration of his four-year term of office, be carried as an extra number in the grade of assistant surgeon-general, unless he be reappointed. As an inducement to physicians to enter the service, the bill provides for the promotion of assistant surgeons to the next higher grade after three years' service, instead of after four years, as at present. The chiefs of the bureaus of zoölogy, pharmacology and chemistry in the hygienic laboratory are to be commissioned by the President, by and with the advice and consent of the Senate, as professors of zoölogy, pharmacology and chemistry, respectively, and are to be entitled to leaves of absence as now provided by law for commissioned medical officers. Provision is made for the appointment of five additional professors, qualified for special work in sanitary engineering, epidemiology, pathology, anatomy, bacteriology, housing, or other matters that relate to the propagation and spread of disease. Men of this class, the committee's report says, often do not have medical degrees, and under the present system of commissioned service only doctors of medicine are provided for; and the bill will remove this defect and make places for men who are specially trained in these highly technical fields, but who are not graduates in medicine.

United States Public Health Service.—Congress has recently made an appropriation for 33 additional Assistant Surgeons in the United States Public Health Service. These officers are commissioned by the President, and confirmed by the Senate. The tenure of office is permanent, and successful candidates will immediately receive their commissions.

After four years' service, assistant surgeons are entitled to examination for promotion to the grade of passed assistant surgeon. Passed assistant surgeons, after twelve years' service, are entitled to examination for promotion to the grade of surgeon.

Assistant surgeons receive $2,000, passed assistant surgeons $2,400, surgeons $3,000, senior surgeons $3,500, and assistant surgeon-generals $4,000 a year. When quarters are not provided, commutation at the rate of $30, $40 and $50 a month, according to the grade, is allowed.

All grades receive longevity pay, 10 per cent., in addition to the regular salary for every five years, up to 40 per cent. after twenty years' service.

Examinations will be held every month or so in various cities, for the convenience of candidates taking the examination. Further information will be furnished by addressing the Surgeon-General, United States Public Health Service, Washington, D. C.

EUROPEAN WAR NOTES.

A British Red Cross Unit in Serbia.—Members of the American medical profession, who were interested last year in the work of Dr. Richard P. Strong and his Typhus Fever Commission in Serbia, will be interested also in a recent publication* describing the simultaneous work in Serbia of a British Red Cross Unit. This unit was recruited from the Royal Free Hospital of London by Mr. and Mrs. Berry, both physicians, who commanded it. The story of the unit is summarized as follows by a reviewer in the British Medical Journal:—

"On arrival it was sent to the chief watering place of the country, Vrnjatchka Banja, and given a disused hydropathic establishment and a school; 100 beds were at once established, but eventually the unit controlled six hospitals with 360 beds, and there was also a British Red Cross Unit in the town. The worst misfortunes of Serbia had not then begun, the chief, and very serious, danger was typhus fever. Consequently the first task was to improvise disinfectors and destructors and to attend to the sanitary policing of the surroundings; fortunately Austrian prisoners were numerous and proved willing helpers. In his plans for the prevention of the dissemination of typhus fever Mr. Berry went whole-heartedly on the assumption that typhus fever is carried by lice and lice only, and the fact that the measures he took, though improvised and in some respects of a summary kind, were completely successful is important evidence of the truth of that theory. One of the hot springs was used for cleansing all patients admitted, and a state coffee-house near by was used as a receiving hospital, where patients were kept for a few days after the bath. On leaving the bath, the patient was given clean hospital clothes, his own having been taken away for disinfection—by boiling whenever this could be carried out without utterly destroying them, the remainder by sulphur fumigation. A wooden barrack was built for patients who developed typhus either in the receiving hospital or in the general hospital.

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* The Story of a Red Cross Unit in Serbia. By members of the unit. London: J. and A. Churchill, 1916.

"When Serbia was overrun the members of the unit had the good fortune to fall into the hands of the Austro-Hungarians,—their actual guardians were Hungarians, by whom they were well treated, and eventually sent home by way of Switzerland. The book is a joint effort, to which several members of the unit have contributed one or more chapters, and is therefore unequal, but is interesting throughout, and the chapters by Mr. Berry and by Dr. Helen Boyle very well written. Many tributes are paid to the courtesy of the Austrian captors, and as an illustration of this, as well as for the light it throws on a principle of Red Cross law, we may quote the following passage (by Mr. Berry):

" 'In fact, our treatment by the Hungarians throughout our captivity bore out a little remark made to us once when we were discussing with a Hungarian officer our position as a Red Cross unit in enemy hands. He admitted that we were technically neither "prisoners of war" nor "interned." In reply to the conundrum, "Then what are we?" he answered, "Let us say guests." And as the Austro-Hungarian authorities supplied us with rations, left us our stores, and asked very little of us in return, "guests" was perhaps a description not so very far wide of the mark.' "

HONORS FOR BRITISH SURGEONS.—It is reported that the British Military Cross for conspicuous gallantry and devotion to duty has been awarded to Dr. John Moir MacKenzie, who received his medical degree from Aberdeen University in 1915 and immediately entered the Royal Army Medical Corps.

"Though wounded in the foot and arm, he refused to go to hospital, and four days later, during a heavy hostile bombardment, he went up through the enemy artillery barrage, and attended many wounded men, though in considerable pain himself."

The Victoria Cross has been awarded to the late Dr. John Leslie Green of the British Royal Army Medical Corps for most conspicuous devotion to duty.

"Although himself wounded, he went to the assistance of an officer who had been wounded and was hung up on the enemy's wire entanglements, and succeeded in dragging him to a shell hole, where he dressed his wounds, notwithstanding that bombs and rifle grenades were thrown at him the whole time. Capt. Green then endeavored to bring the wounded officer into safe cover, and had nearly succeeded in doing so when he was himself killed."

HONORARY DEGREE FOR CAPTAIN KOENIG.—Report from Amsterdam by way of London on August 26 states that the University of Halle has conferred the honorary degree of M. D. on Captain Koenig of the German submarine *Deutschland* "for having broken the enemy's blockade, thereby enabling the German medicochemical industry to recover its world position."

MAY A SOLDIER REFUSE TREATMENT?—There is now being tried before a court at Tours the case of a French soldier who refused to receive the electrical treatment ordered for him by his surgeon. In this case the soldier, a Zouave, set upon the surgeon and beat him with his fists. The real question is, however, whether a soldier has the right to refuse to accept treatment ordered by his superior officer. The decision of the court will be awaited with much interest inasmuch as the principle involved will affect thousands of individuals.

CANADIAN RED CROSS.—The recently published eighth annual report of the Canadian Red Cross records the work of this society during 1915 at home, in England, and in the several war zones.

"As regards the work in England, which is under the able direction of Colonel C. A. Hodgetts, C.A.M.C., the Duchess of Connaught Red Cross Hospital, in Major Astor's park overlooking the Thames at Cliveden, under the command of Colonel Gorrell, C. A. M. C., of Ottawa, has accommodation for 900 patients, and the King's Canadian Red Cross Hospital at Bushey Park for 300. The Peak Hydro, at Buxton, has been taken over by the society and converted into the Canadian Medical Services Special Hospital for rheumatism; and as the need was felt for more hospital accommodation for officers a house in Hyde Park Place, London, was obtained through Colonel and Mrs. Gooderham of Toronto, who paid for the equipment and alterations necessary to convert this residence into the Daughters of the Empire Canadian Red Cross Hospital; the cost of maintenance of this hospital has been undertaken by the Canadian Militia Department. The society has also given material assistance to a number of other hospitals and institutions in England and France and to the military hospitals established in

Canada. The treasurer's report shows that the following contributions were made by the society during the year:

"British Red Cross Society, $50,000; French Red Cross Society, $23,500; St. John Ambulance and Brigade, $25,000; Duchess of Connaught's Hospital, Cliveden, $14,950; Queen's Canadian Military Hospital, Beechborough Park, $5,005.

"Other disbursements included: Amount remitted to London office, $340,796.98; ambulance and equipment, $41,281; clothing, hospital, and service supplies, $54,073; packing and shipping charges, $32,335; badges, brooches, and pins, $6,214; advertising and publicity, $7,847; office maintenance and expenses, $33,621.

"During the year 78 Red Cross nurses were sent to England by the society, and 45 of them subsequently went to the Mediterranean.

"An agreement was made in May last whereby the position of the Canadian Red Cross Society in France was clearly established as a branch of the British Red Cross Society. The work in France is in charge of an assistant commissioner, Captain H. W. Blaylock, assisted by Captain G. W. Bridges. Two supply dépôts have been established at Boulogne, and there are advanced dépôts with each of the Canadian general hospitals. In Paris a dépôt has been established for the distribution of supplies to French hospitals and to the Canadian Hospital at St. Cloud. From November, 1914, to the end of 1915, 56 ambulances were placed by the society at the disposal of the C.A.M.C."

Directory of War Relief Funds.—In response to requests, we are glad to reprint from the Boston *Transcript*, in part, the following classified directory of the principal European War relief funds:

FOR THE WOUNDED.

American Ambulance Hospital in Paris—Mrs. E. D. Brandegee, Room 604, 82 Devonshire street, or J. P. Morgan & Co., New York, collects funds. Robert Walcott, 911 Barristers Hall, Boston, collects funds for ambulances for Francis T. Colby's corps in connection with the hospital. Mrs. Harry Payne Whitney has given a private field hospital of her own also in connection with the hospital.

American Fund for French Wounded—Kidder, Peabody & Co., 115 Devonshire street, Boston.

American Hospital at Lyons—To maintain organization run by Americans at Lyons, France. Henry B. Sheahan, 12 School street, Quincy.

American Hospital Bag Fund—Miss Frances Fowler, 4 Kirkland Place, Cambridge.

American Volunteer Motor Ambulance Corps, headed by Richard Norton of Boston—Collections being made by Elizabeth Gaskell Norton, 83 Mt. Vernon street, Boston, or Brown Bros., 59 Wall street, New York. This corps has been approved by the British Red Cross and is affiliated with the St. John's Ambulance Society.

American Women's War Relief Fund of London—To run and equip an American hospital at Paignton, England. Hon. Treas. Walter Burns, 50 Grosvenor street, London, W.

Artificial Limb Fund—Mrs. Robert W. Lovett, 7 Fairfield street, Boston.

B. F. B. (British, French, Belgian) Permanent Blind Relief War Fund—Eugene V. R. Thayer, president, Merchants' National Bank, State street, Boston.

P. S. D. Fund (Physicians, Surgeons, Dentists)—16 East 47th street, New York City.

Scottish Women's Hospitals—Mrs. R. C. Maclaurin, 187 Bay State Road, Boston.

Special American Hospital, Paris, for Wounds of the Face and Jaw—Lee, Higginson & Co., 44 State street, Boston.

Surgical Dressings Committee of National Civic Federation—Old Colony Trust Co., 17 Court street, Boston.

FOR WAR SUFFERERS (CIVILIAN).

American Red Cross—F. L. Higginson, Jr., 44 State street, for funds only. The society collects clothing, etc., at the Public Interests League, 685 Boylston street.

Belgian Relief Fund—Headquarters, corner Boylston and Berkeley streets. J. H. O'Neil, for subscriptions only. William Firth collects clothing and money to buy clothing for the Belgian refugees in England, Holland and France.

Mercier (Cardinal) Fund—Francis L. Higginson, 44 State street, Boston.

Oberammergau Orphans' Home—Emil Ahlborn, 258 Marlboro street, Boston.

Orphelinat des Armées—Allan Forbes, State Street Trust Co., 33 State street, Boston.

FOR THE SOLDIERS AT THE FRONT.

Allies' Tobacco Fund—S. Hooper Hooper, treasurer, care Bartlett Bros. & Co., 60 State street, Boston.

Belgian Soldiers' Tobacco Fund—Francis R. Jones, 1310 Flatiron Building, New York.

Carter's Army Hut Work—William Endicott, 115 Devonshire street, Boston.

La Fayette Fund—To provide an outfit of necessities for the French soldiers in the trenches. La Fayette Fund, Old Colony Trust Company, Boston.

NATIONAL RELIEF FUNDS.

Armenian Fund—H. D. Forbes, National Shawmut Bank, 40 Water street, Boston.

British Imperial Relief Fund—Charles H. McIntyre, 18 Tremont street.

Brittany Fund—Mrs. William E. Frenaye, Dedham, Mass.

Friends of Poland—Roger Wolcott, 60 State street, Boston.

German Relief Fund—For German sufferers. Dr. Rudolph Hertz, 32 India street, Boston.

Italian War Relief—Lee, Higginson & Co., 44 State street, Boston.

Jewish Relief—Harry Fischel, 63 Park Row, New York.

National Allied Relief Committee—Lee, Higginson & Co., 44 State street, Boston.

Polish Relief Fund—To relieve the war sufferers of Poland. W. P. Blake, 27 Kilby street, Boston.

Prince of Wales National Relief Fund—For destitute non-combatants of England. R. M. Stuart Wortley, 25 Broad street, New York.

Prisoners of War Relief (Teuton)—Transatlantic Trust Co., 67 William street, New York.

Prussian Fund—Hubert Cillis, 50 Union Square, New York.

Russian War Relief Fund—For Russian war sufferers. Mrs. Curtis Guild, 124 Marlboro street, Boston.

Secours National—For the relief of the French women and children. Mrs. Whitney Warren, 16 East 47th street, New York.

Serbian Distress Fund—John F. Moors, 111 Devonshire street, Boston.

Syrian Relief Fund—Charles R. Crane, 70 Fifth Avenue, New York.

WAR RELIEF FUNDS.—On September 2 the totals of the principal New England relief funds for the European War reached the following amounts:—

Belgian Fund.............	$150,177.49
French Wounded Fund....	115,523.94
Armenian Fund..........	66,461.10
French Orphanage Fund...	61,453.83
Surgical Dressings Fund..	45,206.37
Polish Fund..............	42,384.07
Italian Fund.............	21,712.54
Prince of Wales Fund.....	14,526.74
Permanent Blind Fund....	4,358.81

MEXICAN NOTES.

RED CROSS PREPAREDNESS.—It is exceedingly gratifying to the American Red Cross to be able to announce to the public and its members:

That during the six months ending July 31, 1916, its membership has increased from about 27,000—which represented the growth of the society during ten years following its reorganization in 1905—to about 210,000,—an increase of nearly 800% in its membership in the last six months.

That in this same time the number of Red Cross chapters organized throughout the country has increased from 110 to 199.

That while up to six months ago practically nothing had been done towards organized Red Cross preparedness for furnishing volunteer aid to the sick and wounded of our Army and Navy in time of war, during the last six months the personnel required for 25 base hospitals of 500 beds each for the Army have been selected and enrolled from among the staff of 25 of the largest and best hospitals of the country; that several Naval base hospitals which are about half the size of the Army base hospitals are now being organized; that funds for the purchase of equipment for 16 of the 25 Army base hospitals, costing $25,000 each, have been subscribed, and that the purchase of the material for these base hospital units has been begun and the equipment as purchased is being stored so as to be ready for immediate use in case of need.

That in addition to this organization of base hospital units, the personnel required for two field columns, for transferring the sick and wounded from the transfer hospitals for the regular Army medical service to the Red Cross base hospitals, have been selected and enrolled from among the staff of two of the important hospitals of the country and $10,000 toward the purchase of the equipment for one of these field columns has been subscribed.

While this really wonderful progress during the last six months is most gratifying to the American Red Cross, and while the Red Cross is more than glad to be able to extend its heartiest congratulations to all its members who by their interest and zeal and their united and untiring efforts have secured this progress, it firmly believes that this great showing and success should be but an added incentive to greater effort and greater success, if possible, in the future. For it should ever be remembered by every patriotic American citizen interested in humanity's cause, that even with this great stride to the front, the American Red Cross is still far behind the standard set by little Japan which with its 40 millions of inhabitants has a Red Cross membership of 1,800,000, with an endowment fund of $13,000,000; while the United States with 100 million people has even now a Red Cross membership of only about 210,000, with an endowment fund of about $1,000,000.

UNITED STATES HOSPITAL TRAIN.—Report from Chicago states that on August 15, the first hospital train built for the United States left that city for San Antonio, Texas.

The train, consisting of 10 coaches, has been built especially for army work, and is said to be as modern in equipment as the hospital trains now in use in Europe. It has a service or combination surgical car, which is in itself a thoroughly equipped operating room, six cars for patients, one standard Pullman, a combination baggage and library car and a kitchen.

RED CROSS BASE HOSPITALS FUND.—On Sept. 2 the total of the Massachusetts Red Cross Base Hospitals Fund reached the amount of $81,745.25.

NEW ENGLAND NOTES.

The Week's Death Rate in Boston.— During the week ending August 26, 1916, there were 238 deaths reported, with a rate of 16.32 per 1,000 population, as compared with 201 and a rate of 13.94 for the corresponding week of last year. There were 55 deaths under one year as compared with 41 last year, and 63 deaths over 60 years of age against 42 last year.

During the week the number of cases of principal reportable diseases were: Diphtheria, 42; scarlet fever, 12; measles, 23; whooping cough, 19; typhoid fever, 5; poliomyelitis, 9; tuberculosis, 47. Included in the above were the following cases of non-residents: Diphtheria, 13; scarlet fever, 3; typhoid fever, 1.

Total deaths from these diseases were: Measles, 3; tuberculosis, 20; poliomyelitis, 6. Included in the above were the following deaths of non-residents: Tuberculosis, 3; poliomyelitis, 1.

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Obituaries.

WARREN FISHER GAY, M. D.

Dr. Warren Fisher Gay died suddenly at his home in Boston, August 26, 1916, at the age of fifty years. The son of Dr. George H. Gay, one of the surgeons to the Massachusetts General Hospital, he was born in Swampscott, July 24, 1866, and was educated at the Boston Latin School and at Harvard College where he was graduated A. B. in 1890. Receiving his M. D. from Harvard Medical School in 1893, he was a house officer at the Massachusetts General Hospital, joining the Massachusetts Medical Society at this time and settling in practice in Boston, at the close of his service. He became assistant surgeon to the St. Elizabeth's Hospital and to the Boston Dispensary, and later was on the visiting staff of the Massachusetts Women's Hospital and assistant orthopedist to outpatients at the Massachusetts General Hospital. He was a member of the Boston Medical Library, Winslow Lewis Lodge, A. F. A. M., St. Bernard Commandery, Knights Templar, Harvard Musical Association, New England Historic Genealogical Society, Society of the Colonial Wars and the Bostonian Society, and he belonged to these clubs: Tennis and Racquet, Harvard, University, and Harvard Club of New York.

On June 8, 1904 he married Ellen Freeman Stickney, daughter of Dr. Josiah and Elizabeth Stickney, who with an only son, George Henry Gay, survives him.

ERNEST WATSON CUSHING, M. D.

Dr. Ernest Watson Cushing died at his home in Boston, August 27, 1916, aged 69 years. The son of Thomas and Elizabeth Baldwin Cushing, he was born in Boston, January 17, 1847, was educated at Chauncy Hall School, of which his father was principal, and at Harvard College, receiving his A. B. in 1867. After spending two years at the Harvard Medical School he went to New York and took his M. D. from the College of Physicians and Surgeons of Columbia University in 1871. He studied abroad and while in Vienna, in the winter of 1873, married there, Maria von Ralenowski, returning to Boston the following year to settle in practice. At first he made a specialty of diseases of the nose and throat and he was connected with the Murdock Hospital on Huntington Avenue. From 1887 to 1903 he edited the Annals of Gynecology and Pediatry and in 1890 translated August Martin's textbook on the diseases of women, becoming professor of gynecology at the Tufts College Medical School in 1894 and holding the position until 1913, when he became professor emeritus. The additional title of professor of abdominal surgery at Tufts was given him in 1897 and Tufts conferred an LL.D. upon him the next year. He was a founder of the Women's Charity Club Hospital, now the Massachusetts Women's Hospital, and was its chief surgeon from its inauguration until his death. He also established a private hospital near at hand to the Massachusetts Women's Hospital and there did a large amount of abdominal surgery.

Dr. Cushing was a member of the American Gynecological Society, the American Medical Association, the Massachusetts Medical Society, having been retired only last June, a fellow of the American College of Surgery and a trustee of the Robert B. Brigham Hospital from its inception. He was possessed of a retentive memory and was an accomplished linguist. He is survived by his widow and five daughters.

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Correspondence.

IS IT WORTH WHILE?

Mr. Editor:—

Some years ago, more than enough for the interest if not for the recollection to have been erased from the memory of all but a small minority of the Massachusetts Medical Society, there was a tempest in our little teapot active enough to excite a good deal of attention in the medical world as well as in the local lay press.

Reminiscences of this ebullition may be found applicable to some more recent sizzlings which have re-echoed in the literature of a wider world.

I refer to the expulsion of several members from the older and larger Massachusetts Medical Society. The separation was accomplished with the result of not hurting the victims, perhaps not even their feelings, pleasing the upholders of an ideal purity among the regulars and getting for that more conservative body a reputation for bigotry which it did not deserve and which it took years to outgrow.

These years have shown that homeopathic practice has been one among many means of disseminating more rational therapeutic views with but little reference to theories and not much more except business and perfunctory, to the name of the sect. In short, homeopathy has done a little good and some little harm in the progress of rational medicine; but rational medicine has made its steady advance with the general progress of biologic science, made practical by an ever increasing host of workers.

The official edicts of scientific societies are registrars of opinion rather than the leaders thereof. Not even high-sounding names of specialties—so easy to compound with the aid of a Greek dictionary—testify to any authoritative expression of opinion unless they have back of them the reputation and character of members with standards varying with their personalities. They are useful only as a crude classification.

Recently a multitude of utterances in professional and popular journals, based upon growing discontent with the present status of medical practice, have been brought to a focus in articles by a brilliant and candid member of this society and called out the reprobation thereof. The feeling was said to have been so strong as to have led to talk of expulsion. Fortunately this extreme action was not taken and it is to be hoped that the long vacation from committee meetings and perfervid oratory will allow the effervescence to subside and that the time-honored teapot will continue to hold its residuum of truths only partly bitter and in part salutary. The righteous indignation against unkind sarcasm and unfair representations may well be left for cooler judgment and the effacing hand of time, while the society combines its efforts with those of the national profession of the United States and the intelligent laity in taking advantage of the useful suggestions.

These are not only not visionary or wild, but are in daily practice where circumstances are favorable. The group system of treatment is daily and extensively in practice in large hospitals,— is, in fact, indispensable. No intelligent hospital practitioner fails to feel the immense advantage, indeed the necessity, of being able to call upon his specialist colleagues in cases which he realizes do not belong to him, and no private practitioner who wishes to do his full duty to his patient does not regret that he cannot extend these advantages to persons of moderate means. One of the suggestions of Dr. Cabot's paper is to call attention or make practical the application to a large class without sending them on a tedious and expensive round of calls almost prohibitory to a large proportion of the community. It requires, however, but little ingenuity to suggest that combinations to accomplish these ends are fully within the scope of friendly coöperation.

Whether my colleagues, leading men in their specialties, who used to sit in their crowded clinics treating commonplace granular lids, plugged Eustachian tubes, hypertrophied tonsils, made more or less money than they would have accumulated by sitting in solitary state waiting for a stray millionaire, I cannot say, but these men earned the esteem of their fellows, which I sincerely trust profited them in the end.

The pessimists will say that we were all actuated by low and mercenary motives. I suppose, being human and cherishing mundane ambitions, we hoped to succeed, but there were some who, without making any pretence to absolutely disinterested philanthropy or general charity, were glad to drudge in these positions without immediate recompense. I speak of what I have seen, not of that of which I am any but a very small part, but I believe the best class of young men beginning the study of medicine are actuated by as high and worthy motives as those of the same class who are entering any career upon which they look as their professional life work. Medicine is too vast a field to deny to any honest worker unlimited scope for scientific inquiry, and the practical side of it is worthy the devotion of the keenest intellect and of the most genuine good sense and good feeling.

Systematic social service, as incorporated in routine hospital work, is indeed a happy thought. Poverty and business embarrassments have long been recognized as factors of great importance in the development of many diseases, especially the psychic. Nobody can find fault with him who promotes the relief of these conditions in or out of hospitals. "Business efficiency" is most usefully promoted according to the tact of the promoter or the intelligence and good sense of the ward.

But the despised general practitioner has known these things for many generations and acted upon them in his crude way as opportunity has offered.

Larger questions than those merely of good taste, kindliness of feeling, and professional courtesy are involved in the propriety of an official organization stamping its approval, or the reverse, upon the utterances of individual members. Such societies may take on in the eyes of the intelligent classes a certain responsibility greater than they deserve, but are more likely, on the other hand, to be looked upon with an indifference which under certain circumstances is almost criminal. It is not well for them to put themselves in any position which will deprive themselves of their due and proper influence on the right side.

Within its limits the aggrieved member has always the privilege of reply and any unjustly maligned class has usually no difficulty in finding spokesmen. Allegations of general incompetence can be met either with excuses and explanations or, on the other hand, with a "*tu quoque*" argument likely to become promptly an unseemly scandal. But an airing of medical ethical disputes involving delicate points of advertising is a direct play into the hands of those who can employ all the resources of the law in defeating that scourge under which the American people more widely, publicly, indecently, and ignorantly and criminally suffer than any other supposedly civilized community.

If the Massachusetts Medical Society could be reasonably accused of any wavering or half-hearted pursuit of any special form of vice, is it not certain that it would be claimed at once as favoring the moral concession, that we should be said to be lowering moral standards, abandoning the legal campaign against poisonous drugs, against criminal abortion, indecent and immoral literature, and bringing the pages of many of our medical journals to resemble indistinguishably those of lowest commercial types? It is true that problematic truths should be brought forward with circumspection, but public reprobation should not be wasted too easily on questions of etiquette and taste.

It seems to be impossible to eliminate the criminal practitioner. Nothing that medical societies can do is of any value except in upholding the strong arm of the law. Even the ignorant ignoramus must be gently, if firmly, dealt with. The friendly association of the better class into groups, the "team work," the good feeling of professional brotherhood not dependent solely on pecuniary relations are undoubtedly steps forward in purging the community of quackery.

But how much is surgery helped forward by the proclamation that there are men who do not know a cancer and who may, therefore, put off the saving diagnosis, or, on the other hand, be tempted to do an unnecessary operation for the sake of the fee? Is it not better that such men should learn, as they may easily do, that their more experienced neighbors would gladly help them for moderate fees or none at all, than that they should be publicly stigmatized as ignoramuses? Is not the cruelest cancer quack made more sure of his prey by the misrepresentations of the helplessness of his victims, or, on the other hand, the over-enthusiastic operator more likely to be stayed by the thought of the revision he may have to undergo at the hands of his more cautious and kindly senior?

ROBERT T. EDES, M.D.

Springfield, Mass., Aug. 24, 1916.